

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2265.—Vol. XLIX.

LONDON, SATURDAY, JANUARY 18, 1879.

[WITH SUPPLEMENT.] {PRICE SIXPENCE. PER ANNUM, BY POST, £1 4s.

**MR. JAMES H. CROFTS, STOCK AND SHARE BROKER AND MINING SHARE DEALER.**  
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.  
ESTABLISHED 1842.

BUSINESS transacted in all descriptions of MINING Stocks and Shares (British and Foreign), Consols, Bonds (Foreign and Colonial), Railways, Insurance, Assurance, Telegraph, Tramway, Shipping, Canal, Gas, Water, and Dock Shares, and all Miscellaneous Shares.

Accounts opened for the fortnightly settlement. A Daily Price List, issued at 5 P.M., giving latest Quotations up to close of Market, and every Friday a general List containing closing prices of the week.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUUSTELL.

**SPECIAL DEALINGS** in the following, or part:—  
100 Bettw-y-Coed, 25%  
15 Chapel House, 25%  
25 Chontales, 12s. 6d.  
20 Colorado, 31s. 3d.  
15 D'Eresby Consols, 27%  
20 East Van, 21%  
25 Eberhardt, 23%  
20 Penstruthal, 4s. 6d.  
15 Hultafall, 4s. 6d.  
30 Javall, 5s. 6d.  
20 Leadhills, 42%  
30 Llanrwst, 28%  
50 Morfa Du, 16s.  
25 Pateley Bridge, 28%  
50 Penstruthal, 4s. 6d.  
50 Pestarena, 4s. 6d.  
30 Parya Mountain, 5s. 6d.  
15 Roman Grav., 28%  
50 Rookhope, 6s.  
10 Tankerville, 23%  
20 West Chiverton, 28%  
\* SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.

**RAILWAYS—SPECIAL BUSINESS.**  
**FOREIGN BONDS—SPECIAL BUSINESS.**  
Fortnightly accounts opened on receipt of the usual cover.  
**JAMES H. CROFTS, 1, FINCH LANE, LONDON.**  
ESTABLISHED 1842.

**MR. W. H. BUMPUS, STOCK AND SHARE BROKER, AND MINING SHARE DEALER.**  
44, THREADNEEDLE STREET, LONDON, E.C.  
ESTABLISHED 1867.

BUSINESS transacted in STOCK EXCHANGE SECURITIES and MISCELLANEOUS SHARES of every description.  
RAILWAYS, BANKS, FOREIGN and COLONIAL BONDS, TRAMWAYS, TELEGRAPHS, and all the LEADING INVESTMENTS.

Accounts opened for the fortnightly settlement. A Stock and Share List free on application.

**MR. BUMPUS has SPECIAL BUSINESS** in the undermentioned:—  
30 Blue Tent, 22%  
50 Birdseye Creek, 13s. 6d.  
100 Bodidris, 25%  
48 Colorado, 29s. 6d.  
70 Chontales, 11s. 6d.  
10 Don Pedro, 19s. 6d.  
10 D'Eresby Consols (off. wanted).  
60 East Caradon, 3s.  
10 East Pool, 28%  
25 Eberhardt, 23s. 3d.  
20 East Van, 28s. 6d.  
30 Frontino, 43s.  
70 Gunnislake (Clitters), offer wanted.  
5 Great Laxey, 21%  
25 Hultafall, 4s. 6d.  
100 Javall, 5s. 6d.  
50 Kapanga, 11s.  
100 Llanrwst, 10s.  
25 Leadhills, 43s.  
25 Mellanear, 24%  
20 New Quebrada, 31s.  
100 Parya Mountain, 5s. 6d.  
50 Pestarena, 3s. 6d.  
40 Port Phillip, 11s.  
75 Penstruthal, 3s. 9d.  
15 Roman Grav., 28%  
20 Richmond, 21s. 3s. 9d.  
10 So. Frances, 43s. 16s. 3d.  
50 Tankerville, 23%  
5 Van, 21%  
10 West Tolgus, 23%  
40 Wh. Greenville, 22%  
25 Wye Valley, 17s. 6d.

\* DON PEDRO.—Acting on my advice several of my clients have this week realised over 100 per cent. profit on shares purchased at the commencement of the present month. The price remains firm at 19s. to 20s., and probably a further rise will be established before long.

**OFFERS WANTED** for the following:—50 £5 fully paid Shares in Hamer's Salt Company (Limited), Northwich; 20 £10 fully paid Shares in the Birmingham Estates Company (Limited); and 50 General Banking Company (Limited), £10 each, fully paid.

**IMPORTANT.**—Owing to the general depreciation which has taken place during the past few months, many really SOUND STOCKS and SHARES may now be secured on very advantageous terms. Investors should, therefore, embrace the present favourable opportunity of purchasing before the inevitable reaction sets in.

A complete "List of Investments" for the present month (containing latest prices and a large amount of useful information) may be obtained free on application to Mr. BUMPUS.

**SPECIAL BUSINESS**, at close prices, in the SHARES of all the principal HOME and FOREIGN MINES.

**WILLIAM HENRY BUMPUS, SWORN BROKER.**  
Offices: 44, Threadneedle Street, London, E.C.  
BANKERS—THE NATIONAL PROVINCIAL BANK OF ENGLAND, E.C.

**MR. E. J. BARTLETT, BRITISH AND FOREIGN STOCK AND SHARE DEALER.**  
No. 30, GREAT ST. HELEN'S, LONDON, E.C.

Post free, One Shilling, Eleventh Edition, "HOW TO INVEST"  
Forwarded on application.

**MR. THOMAS THOMPSON, JUN., STOCK BROKER,**  
1, PALMERSTON BUILDINGS, BISHOPSGATE STREET, LONDON, E.C.

Mr. THOMPSON transacts business in every species of Stock Exchange and Mining Securities.

Mr. THOMPSON affords reliable information to investors, and can give, when desired, a list of first-class Stocks and Shares, yielding 4 to 10 per cent. dividends upon present prices.—Mr. THOMPSON'S weekly Circular may be had on application.

**MESSRS. JONES AND HOUSTON, 25, CROSBY HALL CHAMBERS, LONDON, E.C.**

Are in a position to do business on particularly and exceptionally advantageous terms in Railway and Government Stocks, Gas, Colliery, Tramway, and Mining Shares, and every class of Investments and Securities.

**DON PEDRO** Shares are almost certain to have another rise of 100 per cent. within the next fortnight. We predict that this will be the best Dividend-paying Mine on the London Stock Exchange, not even excepting the celebrated St. John del Rey.

**RHYDALUN** Shares are also recommended for a great rise. 50 tons of ore have been sold for last month at a large profit.

BANKERS: London and Provincial.

**MR. GEORGE BUDGE, STOCK AND SHARE DEALER**  
9, GRACECHURCH STREET, LONDON, E.C. (Established 26 years)

**ALL BUSINESS TRANSACTED FREE OF ANY CHARGE FOR COMMISSION.**

**Notice to Investors and Speculators.**  
Mr. Budge has SPECIAL BUSINESS in—  
100 Bodidris, 25%  
100 Cambrian, 25%  
20 Cook's Kitchen, 22s. 6d.  
35 Cakemore, 23%  
30 Chapel House, 25%  
2 D'Eresby Cons., 27%  
100 Don Pedro, 19s. 6d.  
50 Devonport and Tiverton Brewery, 3s.  
3 Dolcoath, 22%  
100 East Caradon, 3s.  
100 Exchequer, 4s.  
150 Flagstaff, 4s.  
30 Grogwinion, 23%  
40 Gleuroy, 10s. 6d.  
130 Gold Run, 5s. 9d.  
50 Llanrwst, 28%  
20 Last Chance, 9s. 6d.  
40 Monydd Gorrdu, 25%  
50 Marke Valley, 12s. 6d.  
25 Mellanear, 24s. 6d.  
60 New Quebrada, 30s. 6d.  
100 New Zealand, 25%  
120 Pestarena, 3s. 6d.  
70 Port Phillip, 10s. 9d.  
85 Parya Mountain, 5s.  
45 Red Rock, 13s.  
130 So. Roman Gravels, 28%  
100 Tamar Silver-lead and Fluor-spar, 23%  
20 Tankerville, 23%  
10 Van, 21%  
50 Wheel Uny, 10s. 6d.  
30 W. Wye Valley, 25%  
25 West Frances, 28%

BUYERS or SELLERS of any of the above, or holders of any Stocks or Shares not readily marketable, will do well to apply to Mr. BUDGE.

**SPECIAL BUSINESS** in Frongoch shares as Buyer or Seller.

### BRITISH AND FOREIGN MINES.

SHAREHOLDERS and INVESTORS desirous of PURCHASING or SELLING SHARES in COPPER, TIN, LEAD, GOLD, or SILVER MINES can do so at market prices, and obtain information regarding the same on personal application, or by letter, of—

Messrs. PETER WATSON AND CO.,  
54, OLD BROAD STREET, LONDON, E.C.  
Telegraphic Messages punctually attended to.

**MR. ALFRED E. COOKE, STOCK AND SHARE DEALER,**  
76, OLD BROAD STREET, LONDON, E.C.  
ESTABLISHED 1853.

**1879.—FOR PROFITABLE SELECTIONS.**  
INVESTORS should read the NEW YEAR'S NUMBER of the "INVESTORS' GAZETTE." Post free Three Stamps; quarterly subscription, 2s. 6d.

ALFRED E. COOKE, 76, OLD BROAD STREET, LONDON.  
ESTABLISHED 1853.

**MR. JAMES STOCKER, STOCKBROKER,**  
2, CROWN COURT, THREADNEEDLE STREET, LONDON, E.C.  
Mr. STOCKER Transacts Business in all Stock Exchange Securities. [Established 1843.]

BANKERS: LONDON AND WESTMINSTER.

**FERDINAND R. KIRK, 5, BIRCHIN LANE, LONDON, E.C.**

"THE WEEK"—A SEPARATE EDITION from that which appears in the Mining Journal is published every Wednesday evening, containing "Notes and Hints on the Stock Markets," with Closing Prices. May be had on application.

**COLLIERIES.**—Special Business in Bilson and Crump, Chapel House, Cardiff, and Newport Abercarn.

**MISCELLANEOUS.**—Investors should notice the low prices reached by General Credit, Hudson Bay, National Discount, Mercantile Bank, Credit, Brighton Aquarium, and Mexican Railway.

BANKERS: London and Westminster, Lothbury.

**MR. T. E. W. THOMAS, STOCK AND SHARE DEALER,**  
3, GREAT WINCHESTER STREET, E.C.

**SPECIAL BUSINESS** in the following:—  
Bodidris, 25%  
East Van, 21%  
Glyn, 25%  
Gored and Merilyn, 25%  
Great Holway, 25%  
Greenville, 22%  
Hultafall, 4s. 6d.  
Lead Era, 28%  
Llanrwst, 28%  
Monydd Gorrdu, 25%  
Pateley Bridge, 28%  
Roman Gravels, 28%  
South Conduarrow, 28%  
Tankerville, 23%  
Wheal Uny, 25%

\* Good to buy for a quick rise.

**MESSRS. ENDEAN AND CO., 85, GRACECHURCH STREET LONDON, E.C., STOCK AND SHARE DEALERS.**  
Established in 1861.

BANKERS: Barclay, Bevan, and Co., and London and Westminster Bank, Lothbury.

English and Foreign Stocks and Shares and all other Securities dealt in for cash or account.

**LLANRWST MINE.**

Special business in these shares at close prices. Buyers and sellers should communicate with us.

**MR. R. TREDINNICK, DEALER IN STOCKS AND SHARES, CONSULTING AND ADVISING MINING ENGINEER,**  
7, UNION COURT, OLD BROAD STREET, E.C.

**MR. JOHN B. REYNOLDS, STOCK AND SHARE DEALER,**  
70 AND 71, BISHOPSGATE STREET WITHIN, LONDON, E.C.  
Established Twenty Years.

BANKERS: London—City Bank.

Cornwall—Messrs. Tweedy, Williams, and Co., Redruth.

**MESSRS. J. TAYLOR AND CO., MINING ENGINEERS AND INSPECTORS,**  
86, LONDON WALL, LONDON, E.C.

Have Agents in England, Scotland, Wales, and on the Continent.

FOR SALE, 100 VIKNEBERG SHARES, at 33s.

**WILLIAM B. COBB, STOCK AND SHARE DEALER,**  
62, CORNHILL, LONDON, E.C.  
BANKERS: The Alliance Bank (Limited).

**MESSRS. E. KINS AND CO., STOCK AND SHARE DEALERS,**  
14, QUEEN VICTORIA STREET, LONDON, E.C.

BUYERS of South De Breeby Shares. SELLERS of Tamar Shares at close prices.

BANKERS: Metropolitan.

**WILLIAM GABBOTT, STOCK AND SHARE DEALER,**  
8, DRAPER'S GARDENS, LONDON, E.C.

BANKERS: The National Provincial Bank of England.

**A. B. BOTT AND CO., STOCK AND SHARE BROKERS,**  
9, UNION COURT, OLD BROAD STREET, E.C.

**MR. EDWARD BREWIS, STOCK AND SHARE DEALER,**  
15, GREAT ST. HELEN'S, LONDON, E.C.

Buyers or Sellers of Mine Shares, Railways, Foreign Bonds, and Miscellaneous descriptions of Stock and Shares may send their orders, and have their business promptly attended to for immediate cash, or the fortnightly account current, or for a deferred settlement.

BANKERS: National Provincial Bank of England.

**MR. JOHN L. M. FRASER**  
(Fourteen years at the Great Miners' Mines),  
CONSULTING MINING ENGINEER AND FINANCIAL AGENT,  
OFFICE.—59, HOPE STREET, WREXHAM.

ADVANCE IN THE PRICE OF LEAD ORE.—No opportunity should be lost in PURCHASING SHARES in MINERA, BRITISH SILVER-LEAD, PLAS DDU, and PANT-Y-MWYN MINES; also in SECURING LEAD ORE ROYALTIES, before a further advance takes place. Full particulars on application.

Visits the Mining Districts of Miners, Mold Mountain, D'Eresby Mountain, British Silver-lead, and others, monthly; and will be happy to inspect any property on his clients' behalf. Instructions should be posted not later than Tuesday a post.

**MR. DAVID COWAN, CONSULTING MINING AND MECHANICAL ENGINEER, AND LICENSED VALUATOR,**  
58, RENFIELD STREET, GLASGOW.

Investigations, Reports, and Valuations made of Coal, Iron, Slate, Pyrites, and other properties at home and abroad. Enquiries for Road and Railway Materials, Mining Plant, Pipes, Castings, &c. Plans, &c., of the most modern and economical mining appliances, fittings, and arrangements.

I have been long acquainted with the principal Coal and Ironworks in the North, with the Slate Quarries in North Wales, and for many years was Chief Engineer of the Tharsis Mines, Works, and Railway in Spain.

**MR. CHARLES THOMAS, MINING AGENT, STOCK AND SHARE DEALER,**  
3, GREAT ST. HELEN'S, LONDON, E.C.

**MR. ALFRED THOMAS, MINING AGENT, AND STOCK AND SHARE DEALER,**  
10, COLEMAN STREET, LONDON, E.C.

"INVESTMENTS AND SPECULATIONS" for 1878.  
Price Sixpence.

**MR. EDWARD ASHMEAD, 62, CORNHILL, LONDON, LONDON MINE AGENT, ACCOUNTANT, AND AUDITOR.**

**MR. W. MARLBOROUGH, STOCK AND SHARE DEALER,**  
29, BISHOPSGATE STREET, LONDON, E.C. (Established 22 Years)

can sell the following SHARES, at prices annexed:—

100 Aberdunant, 25%	25 Frontino, 23%	50 Port Phillip, 10s.
50 Bodidris, 25%	40 Flagstaff, 4s.	20 Pateley Bridge, 21s. 3d.
50 Cambrian, 25%	25 Great Holway, 24%	100 Penstruthal, 3s. 6d.
30 Colorado, 31s. 3d.	25 Last Chance, 9s. 6d.	15 Richmond, 21s. 3s. 6d.
50 Cakemore Col., 23s. 15s.	20 Leadhills, 42%	60 Rookhope, 6s.
50 Chontales, 11s. 3d.	60 Javall, 5s. 3d.	50 Rossa Grande, 1s. 6d.
25 Don Pedro, 19s.	20 Llanrwst, 28%	100 So. Roman Grav., 3s.
25 East Van, 21%	10 Monydd Gorrdu, 25%	25 Tyn-y-Fron, 25%
15 Eberhardt, 23s. 17s. 6d.	50 N. Zea Kap., 11s. 9d.	15 W. Chiverton, 11s. 3d.
100 Exchequer, 4s.	25 N. Quebrada, 21s. 15s.	70 Wh. Crebor (off. wtd.)
20 East Caradon, 3s.	10 Pant-y-Mwyn, 23s. 5s.	100 York Penin., 3s. 9d.
	200 Pestarena, 3s. 9d.	

**SPECIAL BUSINESS** in Frongoch and Lead Era.

Shares bought and sold at net prices. Telegrams promptly attended to.

**FOR SALE, THE WHOLE OR PART:—**  
50 Gored and Merilyn, 25%  
50 Pant-y-Mwyn, 23%  
100 Bettw-y-Coed, 21%  
50 Hultafall, 23%  
50 Glyn, 12s. 6d.  
50 Pant-y-Mwyn, 23%  
100 Tyn-y-Fron, 25s. p. 10s.  
50 Lead Era.  
100 Pandora, 17s. 6d.

Address, H. WILKINS, 3, Heybourne Villas, Tottenham.

**FOR SALE—50 Bodidris Lead Mine, fully paid (Limited), at 14s. 6d. each, cash.**  
Address, Mr. C. GENTIL, 36, Christie-road, Cassland-road, E.

**FOR SALE (£3 paid), ONE HUNDRED AND TWENTY-FIVE SHARES in ARENDAL MINING AND SMELTING COMPANY (LIMITED).** No reasonable offer refused.

Apply to Mr. JOHN DAW, Aandal Mines, Skien, Norway.

**CAMBRIAN MINING COMPANY.—FOR SALE, on any reasonable offer, TEN SHARES, fully paid.**  
Letters to be addressed "E. E.," MINING JOURNAL Office, 26, Fleet-street, E.C., London.

**CAKEMORE, CAUSEWAY GREEN, AND LOWER HOLT UNITED BRICKWORKS AND COLLIERY COMPANY (LIMITED).**  
NINETEEN £3 Shares, fully paid up, TO BE SOLD at a considerable discount for cash.

Address, by letter, to "Holder," at Horncastle's Central Advertisement Offices, 61, Chancery Lane, London.

**WANTED, SUNDRY IRON HURDLE GATES, suitable for Agricultural Purposes; also FOUR or FIVE WATER TANKS.** Plates 1/2 to 1 in thickness, 6 feet wide, 6 feet high, and 12 feet long, or thereabouts. Tanks with iron stays preferred.

Address, full particulars and lowest price, to "C. C.," The Court, Diss, Norfolk.

**RICH MINES—COPPER, MANGANESE, IRON.**

**WANTED, a CAPITALIST or a COMPANY, with capital, to UNDERTAKE the WORKING of either ONE or ALL these MINES ABROAD.**  
For further particulars, apply to C. D. VASSILIADIS, 7, Cable-street, Liverpool.

**WANTED, a SITUATION as AGENT in METALLIFEROUS MINES at home or abroad.** Have had ten years foreign experience. At present engaged in Lead Mines, North of England. Practically acquainted with Machine Drills, Electric Blasting, &c., also Surveying. Have Manager's Certificate of Competency (Coal). Testimonials and references to present employers.

Address, "C. R.," MINING JOURNAL Office, 26, Fleet-street, E.C.

**TO CAPITALISTS, INVESTORS, OR PROJECTORS.**

**A GENTLEMAN from Abroad (making a limited stay in London)** is desirous of SECURING the CO-OPERATION of those having the command of CAPITAL in an enterprise of STERLING WORTH and PROMISE.

Address, "A. L.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

**A F.G.S. and CONSULTING MINING ENGINEER, in the West of England, whose Pupils have all passed well, is PREPARED to INSTRUCT CANDIDATES for the forthcoming JULY EXAMINATIONS.**  
Apply for terms to "F.G.S.," MINING JOURNAL Office, 26, Fleet-street, E.C.

**TO SURVEYORS.**

**A MINING ENGINEER, of good position, and holding remunerative appointments, would be WILLING to TAKE a PARTNER as SURVEYOR.**  
Apply, in first instance, "A. B. C.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

**JUNIOR PARTNERSHIP WANTED, by a Gentleman experienced in all branches of MINING ENGINEERING.** Served Articles with a most eminent Civil and Mining Engineer. Able to UNDERTAKE ENTIRE or PART MANAGEMENT.

Apply, by letter, to "Rex," Apsley House, 119, Lansdowne road, Notting Hill, London.

**MINING AGENT OPEN TO A RE-ENGAGEMENT.**  
Has had considerable experience in METALLIC MINING in CORNWALL and the NORTH OF ENGLAND; also 15 years on the Continent. Speaks English, French, German, and Spanish, and has charge of mines for many years. Practically acquainted with the most modern dressing apparatus, the most economical pumping and winding engines, boring machines, smelting, and general steam and water appliances. Inspections undertaken; plans of mines and assays carefully executed. Unexceptionable references.

Address, Mr. NANCY, 22, Stanley-street West, North Shields, Northumberland.

**ANTIMONY MINE—Rich, easily worked, near a Shipping Port in CORNWALL.**  
For particulars, apply to Capt. VINE, Camelford.

**TO COAL MERCHANTS.**

**THE PROPRIETOR of LARGE COLLIERIES in YORKSHIRE,** near Leeds, is DESIROUS of INTRODUCING his COALS into the London Markets, and is anxious to MEET a GENTLEMAN who will UNDERTAKE the AGENCY.

Apply, with two references, to E. STUTCHBURY, F.G.S., Consulting Mining Engineer, 1, Bristol Chambers, Nicholas street, Bristol.

**PUBLIC COMPANIES OFFICES RENT FREE.**  
Books kept by experienced Clerks at a small cost.

Apply to Mr. E. HOWELL, 10, Bush-lane, London, E.C.

**ENGINE (8-h.p.), with VERTICAL BOILER and CENTRIFUGAL PUMP attached; another ENGINE (8-h.p.) with BOILER only; a quantity of WROUGHT and CAST IRON FLANGED PIPES, nearly new, very cheap.**

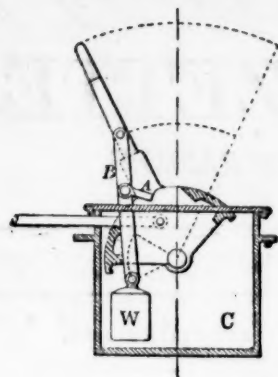
Address, "Steamer," at C. H. May and Co.'s General Advertising Offices, 75, Gracechurch street, London, E.C.

**THOMAS BROTHERS, MINING SHAREBROKERS AND MINERAL SURVEYORS,**  
STRAND CHAMBERS,  
STRAND STREET, LIVERPOOL.



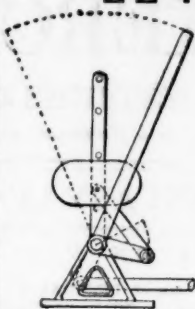
# SWITCHES AND CROSSINGS,

FOR RAILWAYS AND TRAMWAYS, WITH PATENT LEVER BOXES.



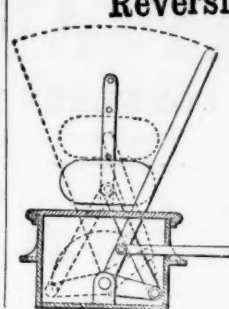
Hartley's Patent Lever Box,  
REVERSIBLE UNDERGROUND,

Can be set to work either way; by turning over the catch at A and reversing the lever, the weight W swings over to C, the catch preventing its return until again turned over. The reversing is effected with very little power, as the weight is raised but a few inches in the operation.



HARTLEY'S PATENT  
LEVER BOX.

Specially designed for Colliery Workings, or where economy of space is an object. Is reversible, and can be locked either way, or dead-locked, so as not to work at all.



Hartley's Patent Locking and Reversible Lever Boxes,

HALF UNDERGROUND,

Will set over both ways, can be locked so as to work on one side only, or the switches can be locked on either side, so as not to work at all. Takes up less room than any other, as the weight does not turn over; works equally well if full of water; can be supplied at the price of an ordinary lever box.

Tank Locomotives, Siding Stops, Wheels, Rails, Chairs, Spikes. Bolts,

AND EVERY DESCRIPTION OF PERMANENT WAY FITTINGS.

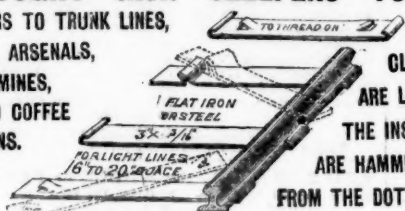
Iron and Steel Pit Cages, Wrought-iron Roofs, Headgears, Girders, Turntables, Patent Coal Tip, Boilers, Engines, Water Cranes.

**HARTLEY and ARNOUX BROTHERS, Stoke-upon-Trent.**

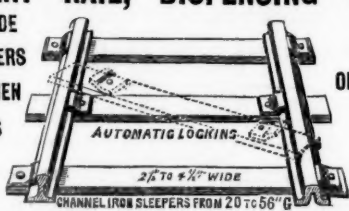
A NARROW GAUGE RAILWAY

WROUGHT IRON SLEEPERS TO FIT ANY RAIL, DISPENSING WITH SPIKES AND ALL LOOSE PIECES.

FOR FEEDERS TO TRUNK LINES, QUAYSIDES, ARSENALS, FORESTS, MINES, SUGAR AND COFFEE PLANTATIONS.



THE OUTSIDE CLIPPING SLEEPERS ARE LAID FIRST, THEN THE INSIDE SLEEPERS ARE HAMMERED UP AS FROM THE DOTTED LINES.



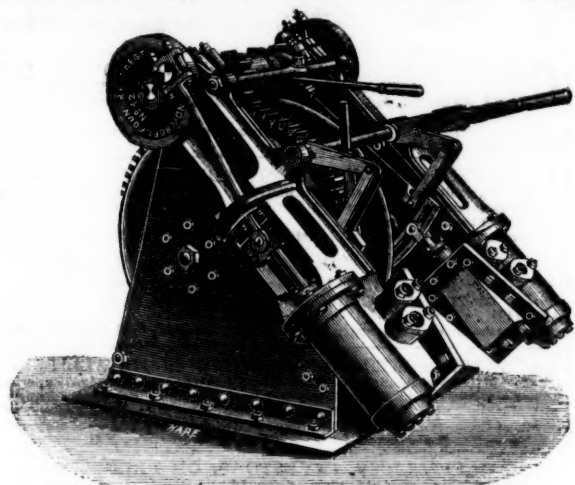
7 MILLIONS OF THESE SLEEPERS ARE IN USE IN ENGLAND, FRANCE, GERMANY, BELGIUM.



FOR CONTRACTORS, FORTIFICATIONS, BRICKYARDS, EARTHWORKS, QUARRIES.

SOLE AGENTS, **SHAW BROTHERS,** BIRMINGHAM.  
DRAWINGS & PARTICULARS ON APPLICATION. TO SAVE TIME, PLEASE GIVE GAUGE, WEIGHT OF RAIL AND KIND OF TRAFFIC.

## IMPROVED PORTABLE UNDERGROUND WINDING OR HAULING ENGINES



London Agents: Messrs. JOHN TAYLOR AND SONS, 6, QUEEN STREET PLACE, SOUTHWARK BRIDGE, E.C

FOR MINES AND COLLIERIES,  
DESIGNED FOR WORKING WITH COMPRESSED AIR, STEAM, OR WATER PRESSURE.  
Specially designed to take up the least possible space.  
BEST MAKE, STRONG, SIMPLE, AND CHEAP.  
All made with two cylinders, to any size.  
Single or double drum, as required.

Photographs and Estimates on application.

**THE SANDYCROFT FOUNDRY**  
And Engine Works Company  
(LIMITED),  
NEAR CHESTER  
(Late the Mold Foundry Company. Established 1838).  
Makers of all kinds of Mining Machinery.

## SAMUEL DENISON & SON'S WEIGHING MACHINES

ARE THE BEST IN THE MARKET FOR

ACCURACY, DURABILITY, AND DESIGN.

SPECIALLY ADAPTED FOR COLLIERIES, MINES, IRONWORKS, BRICKWORKS, AND RAILWAYS.

**SPECIALITE!!—Pit-bank Weighing Machines, with our latest improved Double Steelyard Indicator. NO LOOSE WEIGHTS. Simplest and most perfect ever brought out.**

REPRESENTED IN THE MINING DISTRICTS BY

**YEADON & CO., Albion-place, Leeds.** Old Grammar School Foundry, Leeds

**YEADON AND CO.,**  
LEEDS,

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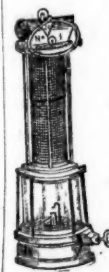
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In most cases to a convenient built upon the temporarily timber being being Where the water during the sinking down sufficient a length of 2 feet effected with added on below the segments adopted by M during the sinking of bolts passing at a time by the ately bolted on surface, in the lining of shaft inserted from shaft. The water-tight g the last ring After this the any vacant place must be filled. The duration the variations shafts. In some metal tubbing metal tubbing case of a (furn Wrought iron is wanting in for the purpose cast-iron. To of each segment in any suspected segment should dimensions. Lottner cit bing at the shaft was lined cribbing, with metres. In o the depth of dammed back metres to the ever, in vario of a careful r of four years however, the metres, so tha a total depth second careful an extent tha menced. The constantly in came incapab sary to set do lining of met The solid w depth of 160 metal tubbing an oaken crib this masonry lowest is 0.65 and the upper masonry is sh meter is 4 me to 3.20 metres inclined some of the mason to 0.83 metres this foundation each crib is 0 five metal tub uppermost of oak cribbing, tubbing tight haste with v strangement still higher. with the flan the segments made fast by inserting stri segment has, whilst the li wards is clos of the metal (1.75 in.) to six segments The upper fl of the tubbing is 0.02 metres vant any ten The horizon tight by inse The four s and after in four bolts fo tight, care b their horizon are then th blocks are t ring, whilst of the upper the vertical outside, are previous to t drawal of th last ring. T screwed up, and vertical Lastly, the posed of two Wedging e especially i the chief am crib is not t ports for car tubbing is th and is term height of 1.9 diameter of



## Lectures on Practical Mining in Germany.

## CLAUSTHAL MINING SCHOOL NOTES.\*—No. CIV.

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,  
Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal).  
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## SECTION V.

In most cases we have considered (where the shaft is first sunk to a convenient depth, the wedging crib laid, and the metal tubing built upon the latter) the sides of the shaft will have to be temporarily timbered during the excavation; the removal of the timbering being effected as the building up of the tubing proceeds. Where the water can be let off into a lower level by a bore-hole during the sinking of the shaft, or where the water can be kept down sufficiently, and the ground will stand without timbering for a length of 2 or 3 yards, the lining by means of metal tubing can be effected without the use of temporary timbering; the rings being added on below as the sinking of the shaft proceeds. In this case the segments are provided with flanges on the inside (as was first adopted by Mr. Buddle), and are connected to each other, or rather during the sinking suspended from the upper segments by means of bolts passing through the flanges. The shaft is only deepened at a time by the height of a segment, the segments being immediately bolted on to the last ring. The lining is suspended from the surface, in the same manner we have described when discussing the lining of shafts with timber. The last segment in each ring is inserted from beneath, and not sideways from the centre of the shaft. The wedging cribs are inserted in the usual manner when water-tight ground is reached; and, if necessary, the segments of the last ring must be specially cast of the most suitable height. After this the wedging of the joints proceeds as before. Should any vacant places occur, owing to part of the side falling out, these must be filled as well as possible by means of clay.

The duration of metal tubing is affected chiefly by saline waters, the variations of temperature and oxidation in upcast and pumping shafts. In some cases it has been found necessary to renew the metal tubing after 15 years, and even 10 years. Sometimes the metal tubing is protected by a 2-in. wooden lagging, or in the case of a (furnace) upcast shaft by a false brick lining  $\frac{1}{4}$  in. thick.

Wrought iron has been used in some cases for metal tubings, but is wanting in stiffness, and in some few cases steel has been tried for the purpose; its chief disadvantage is its cost compared with cast-iron. Too much importance cannot be laid upon the soundness of each segment, which should be carefully examined by striking it in any suspected place pretty sharply with a hammer, and each segment should be tested as to its agreement with the prescribed dimensions.

Lottner cites as an interesting example the use of metal tubing at the St. Max pit, in the Carling district, Lorraine. The shaft was lined in a water-tight manner by means of solid oak cribbing, with a polygonal section of 18 sides to a depth of 160 metres. In order to strengthen the lining it was provided below the depth of 80 metres with an iron armature. The water was dammed back, so that the shaft was sunk to the total depth of 208 metres to the coal seam. Leakages soon showed themselves, however, in various parts of the lining, which were stopped by means of a careful re-wedging from the top to the bottom, and for a period of four years the water was successfully kept back. Suddenly, however, the water broke through the lining at a depth of 144 metres, so that the shaft, which had in the meantime been sunk to a total depth of 355 metres was filled to a height of 280 metres. A second careful wedging succeeded in keeping the water back to such an extent that the pit could be cleared and the working again commenced. The lining leaked, however, so much that the pit was constantly in danger of being flooded, and at last the pumps became incapable of keeping the water under, and it became necessary to set down the pit altogether, for the purpose of inserting a lining of metal tubing inside the defective oak cribbing.

The solid wood cribbing, as before mentioned, commenced at a depth of 160 metres. At a depth of 168 metres the foundation for the metal tubing was laid in the following manner:—On the old walling an oak crib 0.36 metres broad and 0.20 metres deep was laid. On this masonry of carefully dressed stone are four rings, of which the lowest is 0.65 metres, the second 0.55 metres, the third 0.45 metres, and the uppermost 0.35 metres, in all a depth of 2 metres. The masonry is shaped so that at the bottom the inner (original) diameter is 4 metres, but at the upper part the diameter is diminished to 3.20 metres. The outer surface of this masonry foundation is inclined somewhat towards the sides of the rock, so that the breadth of the masonry which on the oak crib is 0.36 metres broad, increases to 0.83 metres in breadth at the upper part of the foundation. On this foundation five cast-iron wedging cribs (superposed) are laid; each crib is 0.40 metres broad and 0.25 metres deep, and on these five metal tubing rings are laid, each being 1 metre in height. The uppermost of these metal rings reached to the foot of the old solid oak cribbing, against which it was intended to make the metal tubing tight by means of wedging cribs. In consequence of the haste with which the work was required to be completed this arrangement had to be left out, and the metal tubing was carried still higher. Each ring of the tubing consisted of four segments, with the flanges on the inside, through which bolts pass connecting the segments together. Both the vertical and horizontal joints are made fast by means of bolts, the joints being made water-tight by inserting strips of sheet-lead 3 millimetres in thickness. Each segment has, as usual, a hole in the centre for the escape of water whilst the lining of the shaft is being carried on, but which afterwards is closed by means of a short screw spindle. The thickness of the metal tubing diminishes by five gradations from 0.45 metres (1.75 in.) to 0.37 metres (1.45 in.). The wedging cribs consist of six segments, the thickness of the metal being 0.35 metres (1.3 in.). The upper flange of the upper wedging crib, on which the lowest of the tubings rest is turned, so that the exterior edge of the flange is 0.02 metres lower than the inner edge. This is done so as to prevent any tendency of the tubings to slide on the wedging cribs. The horizontal and vertical joints of the wedging cribs are made tight by inserting thin pieces of oak.

The four segments of each ring are lowered on to the last ring, and after introducing the sheet-lead between the vertical joints the four bolts for tightening each of the vertical joints are screwed tight, care being taken to tighten them so that they shall retain their horizontal position. The four segments (forming the ring) are then thus raised together for a height of 18 to 20 in. Wooden blocks are then pushed into this space, so as to support the last ring, whilst the sheet lead is carefully laid over the horizontal surface of the upper flange of the last tubing ring. The strips of lead in the vertical joints, which project slightly both on the inside and outside, are driven at the back as well as into the joints, previous to the lowering of the next ring, upon which (on the withdrawal of the wooden blocks) the tubing ring is lowered on to the last ring. The bolts to tighten the horizontal joint are inserted and screwed up, after which the projecting lead, both in the horizontal and vertical joints, are caulked by the means of chisel and hammer. Lastly, the space behind the segments is filled with a beton composed of two-thirds cement (from Vasey) and one-third lime.

Wedging cribs are inserted in the metal tubing in many places, especially in the neighbourhood of a depth of 144 metres, whence the chief amount of water comes. The object of these wedging cribs is not to dam back the water step by step, but to form supports for carrying part of the weight of the tubing. The metal tubing is thus carried to a height of 72 metres below the surface, and is terminated by a series of wooden wedging cribs of a total height of 1.90 metres; on this a moulding piece increases the interior diameter of the pit. The moulding piece is attached to the old

solid wood tubing. Above the moulding piece 36 cribs of oak are bolted to the old timbering. Between these cribs and the moulding piece screw-jacks were inserted, but the pressure thus obtained was not sufficient to close the moulding and the immediately underlying pieces water-tight. The junction was made effectually water-tight by means of a caoutchouc lining, which was pressed tight by means of struts to the underside of the oak cribs.

## BORING AND LINING OF SHAFTS EXCAVATED BY BORING.

In the years 1823-25 Herr Heyn, of the Prussian mining service, executed a series of borings 12 in. to 18 in. diameter in the neighbourhood of Bochum, in Westphalia. These bore holes were sunk, chiefly for the purposes of ventilation, to the workings of some of the uppermost coal seams; many of them were, however, afterwards enlarged in diameter so as to form travelling shafts. The idea of boring the holes at once large enough to serve for travelling was common property long before the first attempt was made. The first to sink bore holes large enough for travelling purposes appears to have been Herr F. Fleckes, of Düsseldorf, and Herr J. Kindermann, of the Schölerpad Colliery, near Essen; the latter obtained in 1843 a patent for a method of lining bore shafts in a water-tight manner, and actually sunk 17 bore holes upwards of 3 ft. in diameter to depths varying between 5 fms. and 30 fms. Herr Honigmann and Rossenbeck improved upon the method used by Kindermann, and made us of a large block, to which nine cutters were attached (somewhat after the apparatus of Messrs. Mather and Platt), which was worked with a free-falling apparatus of peculiar construction. In 1848 the celebrated boring engineer Kind commenced the boring of a shaft 14 ft. in diameter, which, as far as the actual boring was concerned, was successfully executed. The deficiency in Kind's method in making the foot of the lining water-tight was removed by a method introduced by Chaudron, a Belgian mining engineer, which, combined with Kind's mode of boring the shaft, constitutes the now well-known method of sinking shafts denominated the "Kind-Chaudron method," which it is the object of the next few numbers to describe.

## GEOLOGICAL SOCIETY OF LONDON.

Jan. 8.—HENRY CLIFTON SORBY, F.R.S. (President), in the chair.

Chas. Barrington Brown, Assoc. R.S.M., Lansdowne-road, Notting Hill; Carl Fischer, M.D., F.L.S., Sydney; and William Coles Paget Medleycot, Ven. Sherborne, Dorsetshire, were elected Fellows; and Dr. F. V. Hayden, Washington, and M. Jules Marcou, Salina, Foreign Members of the Society.—Arthur Ernest Baldwin, Sunnydale, the Avenue, Lee; James Farie, Highbury Quadrant; Benjamin Neeve Peach, Assoc. R.S.M. Melrose; and Brenton Symons, Truro, Cornwall, and Maidanpek, Servia, were proposed as Fellows of the Society.—John Edward Marr, B.A., St. John's College, Cambridge; and Henry Tryon Wing, Lieutenant 97th Regiment, Junior Army and Navy Club, Grafton-street, will be balloted for as Fellows of the Society.

The following communications were read:—

1.—"On some Tin Deposits of the Malayan Peninsula," by Patrick Doyle, C.E. (communicated by the Rev. T. Wiltshire, M.A., F.L.S., F.G.S.)

The tin ore of the Malayan Peninsula is obtained from "stream-workings" in an alluvial plain extending between a range of granitic mountains and the sea. The author describes the mines of the district of Larut Perak. The ore is got in open workings at an average depth of about 10 ft. The tin-bearing stratum has an average thickness of 4-8 ft.; it is overlain by stratified sand and clay, and rests upon either porcelain clay or, sometimes, a sandstone. The ore varies from a fine sand, near the sea, to a coarse gravel, near the mountains, and is mixed with quartz, felspar, mica, and schorl. The author is of opinion that the stratum of ore has been derived from the granite of the mountain range, in which it still occurs in veins, by denudation, and under conditions which still exist, though in a modified form.

Mr. W. W. SMYTH remarked that the details given in the paper corresponded closely with those of stream-workings in other localities. Information on such subjects was important to capitalists. Large areas of alluvial deposits appeared to be rich in tin ore in many places on the east side of the Bay of Bengal. So far as he knew this was the first description of the region of Perak, and he trusted we should have more. He called attention to the association here, as in Queensland and elsewhere, of tin with granite. Myneer van Groot had informed him that in the islands of Bellan and Banks the tin was associated with slaty rocks curiously like those of Cornwall and Devon, probably, though on slight fossil evidence, of Devonian age.

Mr. J. H. COLLINS remarked that the similarity mentioned by Mr. W. W. Smyth extends to the associated minerals also; for wolfram and gibberite were abundant in the specimens on the table, as in the stanniferous granites of Cornwall.

2.—"Description of Fragmentary Indications of a huge kind of Theriodont Reptile (Titanosuchus ferox, Owen), from Beaufort West, Gough Tract, Cape of Good Hope," by Prof. R. Owen, C.B., F.R.S., F.G.S.

3.—"Notes on the Consolidated Beach at Pernambuco," by J. C. Hawshaw, M.A., F.G.S.

The next meeting of the Society will be held on Jan. 22, when the following communications will be read:—1. "On Community of Structure in Rocks of Dissimilar Origin," by Frank Rutley, F.G.S.—2. "Distribution of the Serpentine and associated Rocks, with their Metallic Ores, in Newfoundland," by A. Murray, C.M.G., F.G.S.—3. "The Gold-leads of Nova Scotia," by H. S. Poole, F.G.S.

CAMBORNE LITERARY INSTITUTION.—The first meeting for the formation of a reading and lecture room, &c. (since grown into an institute), in Camborne was held in the Grammar School on Sept. 3, 1833. The following are the names of the members who attended the first meeting:—Messrs. Richard Lanyon, John Thomas, Richard Rule, George Smith, Charles Bennett, William Thomas, John H. Budge, John Ellery, Alfred May. J. H. Budge and W. Thomas (who has been manager of mines in the south-west of Ireland nearly 40 years), are the only survivors!

THE LIABILITY OF COLLIERY AGENTS.—At the Longton Police Court Martin Forrester, agent of the Weston Coyney Colliery Company, was summoned, by direction of the Home Office, for having neglected on Oct. 12 to cause the pit to be adequately ventilated. Mr. Booth appeared for the prosecution, and Mr. Welch for the defence. It may be recollected that several weeks ago Mr. Forrester was summoned for a similar offence on another date, and at the same time the manager of the colliery was charged with a like violation of the Act. The latter was convicted, but the stipendiary held that Mr. Forrester was not responsible for the condition of the mine, and dismissed the charge against him. On that occasion Mr. Gilroy, assistant inspector, spoke to having visited the colliery on Oct. 12, and found it insufficiently ventilated. He directed certain things to be done, which, on subsequently going to the pit, he found had not been done. The present proceedings were taken to test the liability of the agent, as representing the proprietors of the colliery. When the case was called on Mr. Welch admitted that the question had been already decided in the case previously tried, but Mr. Booth argued that this was a different offence, being on a different date. Mr. Greenwood said he still held that the agent was not responsible, but the manager, and he regarded the new proceedings as an attempt by a side wind to upset his previous decision.—Mr. Wynne, Government Inspector, said he wished to have a legal decision as to the liability of the agent.—Mr. Greenwood said that if the case was reopened that question would not be affected. The prosecution had better go to a superior court.—Mr. Booth asked for a case, but as there was now no charge formally before the Court, and the time for obtaining a case on the former decision had elapsed, this could only be granted by consent.—Mr. Welch said he would not object to the question going to a superior court if his client was freed from any cost in the appeal.—Mr. Wynne said he had no power to give an undertaking that the Home Office would pay the cost.—Mr. Welch said if the Home Office was not satisfied with the decision of the magistrates it was not fair to make his

client pay for taking the question to a higher tribunal.—After some discussion it was agreed to adjourn the matter for a week, with a view to an arrangement in the interim as to the course to be taken in respect to the case.

## ADMIRALTY EXPERIMENTS ON COAL AND PATENT FUEL.

The return of all experiments made by the Admiralty on Coal and Patent Fuel since the return of May, 1877, contains much interesting information as to the comparative value as steam generators of coal, anthracite, and patent fuel, with the opinions of various naval authorities thereon. The trials made include elaborate experiments with Newcastle and Bulli Australian (bituminous and non-bituminous) coal, Labuan coal, Newport Abercarn Black Vein steam coal, Buller (New Zealand) coal, with an analytical report; Aberdare 4-ft. coal, Radford's Navigation South Wales steam coal, and East Wylam steam and furnace coal. As to the Australian coal, the consumption per indicated horse-power per hour was with New Wallsend, 5.97 lbs.; with Bulli, non-bituminous, 4.83; with Newcastle bituminous, 5.27; and with a mixture of  $\frac{1}{2}$  Newcastle and  $\frac{1}{2}$  Bulli (average of 26 trials), 6.04 lbs. The total waste with the four sorts respectively was 19.5, 21, 13.9, and 18 per cent., and the price per ton at Sydney was 14s., 15s., 19s., and 16s. 4d. respectively. As to the New Wallsend coal, the engineers remarks are—Burns very freely at first, but soon leaves a great quantity of ash, which has to be removed, causing great loss; requires an open grate, and free supply of air. Inferior quality, not good for the service. Of the Bulli coal he says—Good quality, burns slowly, very economical, requires an open grate, and free supply of air. Is not good for the rapid generation of steam. The Newcastle he describes as—Very good quality; does not require so open a grate as the above coal; is fairly economical, and very good for the rapid generation of steam. And of the mixture he says—These coals do not contain sulphur in sufficient quantity to cause injury to furnaces or fire-bars. Soot is deposited quickly; tubes have to be swept at intervals of from 24 to 30 hours. Careful stoking required while burning this mixture. Subsequent trials in the Sapphire and Sappho (those mentioned were in the Pearl) gave much better results, the consumption per indicated horse-power being only 3.6 lbs. to 2.99 lbs. on the average per hour.

Referring to these experiments, Commodore Hoskins reports that much delay has occurred, owing to the difficulty experienced from the peculiar nature of the service on this station and its great extent, in carrying out the trials under the prescribed conditions; but now forwards the reports received. In the case of the Pearl, experiments made previous to the receipt of the order have been added. From his own experience, and after examining the reports, he is of opinion that for all the ordinary peace service of our ships of war the Bulli coal is much to be preferred to the other sorts, or to a mixture; it is clean, economical, and gives a favourable return of miles run for expenditure at the lower rates of speed. It is, however, a slow burning coal, and, as our furnaces are fitted, the full power of the engines cannot be developed by it. The Newcastle coals are bituminous and quick burning, give a higher rate of speed with less mileage for expenditure, but give off volumes of black smoke, even when the smoke-consuming apparatus is fully open, and are very objectionable on that score. The original cost at Sydney, from local causes, is much in favour of the Bulli coal, being about 15s. (14s. 6d. per ton by new tender, July, 1877) per ton, as compared with 18s. 6d. for Newcastle, and the work done by it renders it still more economical in comparison. But it is difficult or impossible to procure it at other ports or in the colonies, the Newcastle coal being almost universally preferred by the merchant steamers from its developing greater power and being less injured by trans-shipment. The chief engineer of the Pearl, after many trials, was led to believe a mixture of the two sorts of coal undesirable, the more friable and slower burning Bulli dropping through the bars, which require a different setting for each description; but the Commodore is disposed to think this difficulty would be got over by careful adjustment. The great impediment to our using the two in combination is that, except at Sydney, Bulli coal cannot ordinarily be procured, and that it deteriorates so rapidly that it would not be desirable for us to have stores of it of our own at other places.

The Labuan coal is the next reported upon. With regard to it Engineer George Duncan, of H.M.S. Curlew, stated that they consumed 57 tons of it during August, 1877, and he adds—"I have found it good and economical for steaming at slow speed, but too light and bituminous for hard steaming. When steaming easy, and the furnace bars closer than usual, ashes can be burned with advantage, making an average of 7 per cent. of ash and clinker, but at high speeds the consumption increases to nearly 100 per cent. over that of Woolangong, Australian coal, although the percentage of ash and clinker from Woolangong exceeds that of Labuan by 70 to 80 per cent." Chief-Engineer Lanksbury, of H.M.S. Charybdis, states that on July 27, 1877, he received 180 tons of coals from the Oriental Coal Company at Labuan, with reference to the quality of which he reports that, having steamed 700 miles with this coal, he considers them to be of excellent quality for generating steam and quick combustion; the fires require to be supplied with coals light and often; emission of smoke moderate, and the percentage of ash, soot, and clinker is 11. During the passage from Labuan to Singapore he had not the slightest difficulty in keeping up the steam as required; he, therefore, is of opinion that the coals are good, and fit for her Majesty's service.

A series of tests of land engine anthracite coal from Messrs. James and Aubrey made at Portsmouth Dockyard showed that 1 lb. of coal would evaporate from 9.11 lbs. to 9.49 lbs. of water from 100° Fahr., the clinker and ash being from 3.14 to 3.73 per cent. Newport Abercarn Black Vein coal similarly tested evaporated from 100° Fahr. from 9.64 to 9.77 lbs. of water per pound of coal; clinker and ash, 3.99 to 4.34 per cent.; half Newport Abercarn Black Vein and half Cowpen-Cambois Hartley gave 9.16 and 3.65;  $\frac{1}{2}$  Newport and  $\frac{1}{2}$  Hartley gave 9.33 and 4.08; the Hartley alone as used in preceding trials gave 8.38 and 3.14; 1 lb. of Nixon's Navigation evaporated 9.18 lbs. of water, and left 3.65 of clinker and ash; and  $\frac{1}{2}$  Newport Abercarn Black Vein with  $\frac{1}{2}$  Nixon's Navigation evaporated 9.79 lbs. of water, and left 3.91 per cent. of clinker and ash. It is remarked that the Newport Abercarn Black Vein coal is harder than the usual Welsh coal, not making so much dust in breaking up; it cokes in the fires, and requires more attention than the usual Welsh coal; it produces a large amount of smoke, the smoke slides being kept fully open, and the clinker is principally slag, and not troublesome.

The Buller New Zealand coal was also tested at Portsmouth Dockyard, but it certainly seems most unfair to the coal to test it after carrying it half round the world. Welsh coal similarly tested would have given a result which would shut it out of the market. With all this disadvantage 1 lb. evaporated from 8.08 to 8.30 lbs. of water, and left from 8.08 to 8.25 per cent. of clinker and ash. This coal is rather tenderer than the usual North Country coals, breaking up easily on being struck with the hammer, but does not make much dust. It cokes a little in the fires, requiring occasional disturbing, and produces a large amount of smoke, the smoke slides being kept fully open. Clinker principally shale, very light, but very large amount. The evaporation per pound of fuel is about the same as our usual North Country coal, but the evaporation per square foot of fire-grate and rate of burning are low. Percentage of clinker and ash very high. The samples submitted to Dr. Percy were so irregular in quality that his analysis and report upon them are of no practical value.

The Aberdare 4 ft. gave results practically identical with the Newport Abercarn 4 ft. It is added that this coal resembles ordinary Welsh coals, but appears to be a little harder and brighter. The sample sent was not so large, and had more dust than is usual with special samples of coal. It is a very free-burning coal, disintegrating very much in the fire. The deposit of soot was very large, being about double the usual amount. The best results were obtained with thin fires. The evaporation per lb. of fuel is lower, and the rate of evaporation about equal to those of average Welsh coals. Clinker-light slag, mixed with a little shale, easily moved. Percentage of clinker and ash, average. The smoke produced is about the same as with ordinary Welsh coal. Radford Navigation

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath Dr. VOX GRONDBECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.



evaporated from 9.51 to 9.70 lbs. of water per lb. of fuel. This coal has the usual appearance of the Welsh coal, but is rather softer, and crumbles a little more in breaking up. It takes considerably in the fires, requiring frequent disturbing, and more attention than the usual Welsh coal. Evaporation per ton of fuel very good, but rate of evaporation below the average. Clinker-light slag, mixed with shale, gives very little trouble. East Wylam evaporated from 8.52 to 8.68 lbs. of water, and left 6.72 to 7.06 of clinker and ash. Two different kinds of coal appear to be formed here in the same seam. The greater portion of it (about two-thirds) has a dull slaty appearance, is much harder than the usual North Country coal, and breaks with a sharp clean fracture. The remaining portion of this coal has the appearance of an ordinary North Country coal, and breaks up in a similar manner. It is a free-burning coal, and produces about the same amount of smoke as Cowpen Cambois Hartley, but leaves a very large deposit of white ash and shale on the fire-bars, making it difficult to keep open the air spaces between the bars, and retarding the rate of evaporation. The evaporation per pound of fuel is higher, but the rate of evaporation much lower than with Cowpen Hartley. Clinker, principally shale, mixed with a little slag, is easily moved. Percentage of clinker and ash very high. Weight of a piece of dull, hard coal in air, 8 lbs. 4 ozs.; in water, 2 lbs. 4 ozs.; specific gravity, 1.37. Weight of a piece of bright coal in air, 8 lbs. 3 ozs.; in water, 1 lb. 14 ozs.; specific gravity, 1.3. Specific gravity of the whole, about 1.35. The furnace coal is similar in appearance, but does not give such good results as the steam coal on the trial.

The chief engineer of H.M.S. Tamar reports that patent fuel burns slowly; that fires cannot be forced with it, either for raising or keeping steam, and, compared with coal of the average quality, more patent fuel has to be expended for similar purposes under similar conditions. About 50 per cent. of the waste from the furnaces appears in the form of clinker, and 20 per cent. of ash; smoke generally of light brown colour; quantity of soot small. Great care is required in stowing patent fuel, and the weight that can be stowed in the ship's bunkers is nearly 10 per cent. less than that of common coal. This happened in the present case, but it should be remarked that the blocks of fuel were mostly shorn of their corners before received into the ship. The heating of the fuel in the bunkers tends in time to produce clogging of the blocks, and the emission of a pitchy smell which makes breathing difficult; also it becomes difficult and dangerous to remove the patent fuel from the bunkers, as the blocks hold together, forming vertical walls and archways overhead as the fuel nearest the bunker doors is taken out. Mixed with common coal the results are not perceptibly different to those obtained from common coal alone. It was reported with regard to the Star compressed fuel used on H.M.S. Triumph that it burns well with a strong draught, but after four or five hours' steaming a large amount of clinker is deposited on the bars, which impedes the burning of the fires, and the ash and clinkers are large, being from 16 to 20 per cent. The report on the same fuel from H.M.S. Minotaur was that it is inferior to the Government mixture (¾ Welsh ¼ North Country) for steaming purposes; it takes longer to stow, and from the irregular shape of the bunkers and the occasional breaking of the blocks there is no gain in the quantity stowed, but it would be advantageous to use, if necessary, to fill the wing passages, or for taking a deck cargo.

#### THE HYGIENIC CONDITIONS OF COAL MINES.

Some interesting information as to the way in which the human system is affected under the peculiar conditions of work in mines has recently been furnished by Dr. Fabre, from experience connected with the mines of Commentry, Allier, in France. The deprivation of solar light causes a diminution in the pigment of the skin and absence of sun-burning, but there is no globular anemia—that is, diminution in the number of globules in the blood. Dr. Fabre infers this from some 400 experiments in which the globules were counted in the microscope by a well-known method. It might be thought this absence of true anemia might be accounted for by the men being out of the mine 14 hours out of the 24, and all day on Sunday. But it is found that the blood of horses in the mine is quite similar in number of globules to that of horses above ground having similar work and food, and these animals are kept in the mines all the year round, except when they are brought up once a year for the general inventory. Internal maladies seem to be more rare, and surgical more frequent in the horses underground than in those above. While there is no essential anemia in the miners the blood-globules are often found smaller and paler than in normal conditions of life. This is due to respiration of noxious gases, especially where ventilation is difficult. The want of oxygen is in the air, which does not supply enough of it to the globules, whereas in globular anemia the globules are too few to bring enough oxygen to the tissues. The horses do not show the kind of anemia observed in miners, because they work in large and well ventilated passages.

The increase of atmospheric pressure in the Commentry Mines is not such as to cause any appreciable physiological disorders, and the ventilation prevents accidents from confined air. The moisture, which is generally excessive in mines, does not incommode or act injuriously on the miners so long as the temperature does not exceed 25°, but when this is exceeded they are very quickly fatigued, and cutaneous eruptions often appear on them. In the spontaneous combustions which frequently occur in the mines the men work in rapidly successive relays to confine the fire, and they experience little more than muscular fatigue, if the air has been pretty pure. The most frequent irrespirable gases are carbonic acid (abundant in these mines), carbonic oxide, ammoniac gas, carburets of hydrogen, and (where the coal contains much iron pyrites) sulphurous and sulphydric acids. These are mostly well carried off by ventilation. The men who breathe too much the gases liberated on explosion of powder or dynamite suffer more than other miners from affections of the larynx, the bronchia, and the stomach. Ventilation sometimes works injury by its cooling effect. Bronchitis is extremely common among the coal-miners, also vesicular emphysema, these affections being aggravated by the coal-dust. On the other hand, pulmonary phthisis seems to be very rare. In six years Dr. Fabre did not meet with more than two cases of death from this cause among 1800 miners. It appears generally that working in the mines of Commentry is rather laborious than unhealthy; it is certainly not to be compared with those frequent operations in which powder containing lead or mercury is breathed.

**INCORUSTATION IN BOILERS.**—About a year ago we called the attention of our readers to a new composition brought before steam users by the well-known firm of J. Berger Spence and Co., manufacturing chemists, of London. From the technical explanations given to us at the time we could foresee that the Globe Steam-Boiler Powder would be a success, and so it has proved to be, as is shown by the number of highly satisfactory testimonials secured by Messrs. J. Berger Spence and Co., some of them emanating from some of the most eminent manufacturing firms in the kingdom. In fact, it seems that in some cases the composition did not only prevent scale, but actually removed scale that had been long covering the boilers. Two of our largest railway companies have ordered a supply of the Globe Steam-Boiler Powder.

**SALE OF CLAYWORKS.**—Mr. William Hancock (of the firm of Hancock and Son), pursuant to an order of the High Court of Justice, Chancery Division, offered for sale, on Thursday last, the 9th inst., at the Globe Hotel, St. Austell, the undermentioned lots:—Lot 1, the Burngallow or Black Pool Clayworks, situate in the parish of St. Mewan, which was started in 500l., was knocked down at 1015l. to Mr. Bennett, of London. Lot 2, 9.16ths parts of shares of Carrancarrow Clayworks, situate in the parish of St. Austell. The first bid for this lot was 300l., which soon reached to 990l., at which amount it was purchased by Messrs. Stocker and Co., of St. Austell, clay merchants. Lot 3, being 6.10ths parts or shares in the cost book adventure in Higher Alvirgan Claywork, also situate at St. Mewan, which was commenced at 100l., was ultimately sold for 500l. to the Higher Henlyn Clay Company. Considering the very dull times, these properties were not expected to reach the total amount realised by 500l., but there was a very large attendance at the sale, and the biddings throughout were very spirited.

There were several clay merchants present, amongst whom were Messrs. Lovell, Higman, Martyn, Barratt, and Nicholls. Mr. Gill, solicitor for Messrs. Gaved and Co., was also in attendance.—*West Briton.*

#### THE HISTORY OF COAL.

The introductory lecture inaugurating the Evening Classes of King's College, London, delivered at the commencement of the Winter Session by the Rev. Thomas Wiltshire, M.A., F.G.S., the dean of the department, contained a large amount of information of great interest and practical utility; it is, therefore, gratifying to find that it has been printed in pamphlet form.\* Continents and seas with unchanged boundaries belong, says Prof. Wiltshire, to the regions of friction rather than to those of fact. Evidence there is derived from the record of fossils that the crust of the earth has from the very beginning been continuously affected by undulating movements, so that the dry ground of the one age becoming depressed has been invaded by a neighbouring ocean, whilst the floor of the latter, elevated in turn, has been transformed into hill slopes and winding valleys. He shows that this was early known by quoting Strabo's Geographicon—"Is it, therefore, surprising that some parts of the earth which are now inhabited should formerly have been occupied by sea, and that those which are now seas should formerly have been inhabited land?" The land-masses brought above the influence of the tides in days long past did not, he continues, remain destitute of vegetation. On the contrary, forests of great extent, clothed with a foliage special to the period, soon masked the ground. At first that foliage had a relationship in structure though not in size to the modern club mosses and ferns. Next a palm-like aspect was predominant. Finally, the present trees and bright flowers came upon the scene.

With regard to the coal resources of various nations, Prof. Wiltshire remarks that the trees of the carboniferous era covered far more than 190,000 square miles of the United States, more than 8000 in Queensland, more than 5000 in England, and more than 1000 in France. Near Edinburgh is a 10 ft. seam of coal, near Ashby-de-la-Zouch is a 12 ft. seam, at Dudley is one 36 ft. thick, and in Poland another 48 ft. thick. In our own country the carboniferous formation is almost the only repository for a mineral which is serviceable for fuel. Out of our own country the fact alters and proves that in past times much more recent than the carboniferous, as in those of the Jurassic, the Cretaceous, and the Tertiary ages, vast forests sprang into being in positions where once had been seas, and left on the ground a vegetable substance, whose relics, subsequently buried up in the sediments of new lakes or new seas, are called at the present day either coals, brown coals, or lignites. He then goes on to refer to the Virginian triassic deposits 250 square miles in extent, and with 40 ft. of coal, and to the Northern India deposits, at least 2000 square miles in extent, and with seams occasionally in excess of 300 ft. Of the same age or earlier are the coal giving districts of China, supposed to be more than 20,000 square miles in extent, and having such great seams that one in the province of Shansi is 30 ft. thick, and produces excellent anthracite, selling at 7d. a ton at the pit's mouth. More recent deposits, once great forests in the ancient geological ages, occur in Italy, in Germany, in Austria, and in our own country at Bovey Tracey, Crech, Alum Bay, and Lewisham, and these not unfrequently attain a considerable thickness. There are beds of this class in Austria which measure 120 ft. from top to bottom.

Referring to the utilisation of coal, the author points out that in none of the most ancient writings are there references to rocks that will give off heat and can serve as fuel. The books of Moses and of Homer are silent on this point—a circumstance showing that coal was not recognised by the early tribes mentioned in history; or if then recognised on any part of the earth, as possibly in China, it had not been heard of by either the Israelites or the ancient Greeks. Marco Polo, who died in 1324, writing of his travels in China says—"Throughout the province of Cathay is found a sort of black stone, which they dig out of the mountains, where it runs in veins; when lighted it burns like charcoal, and retains the fire much better than wood, inasmuch that it may be preserved during the night, and in the morning be found still burning. It is true there is no scarcity of wood in the country, but the multitude of inhabitants is so immense, and their stoves and baths which they are constantly heating, so numerous, that the quantity could not supply the demand." But as Prof. Wiltshire says, the remarks of the ancient authors had little to do with what would profit the furnace or the forge. We of the nineteenth century, who boast of our superior knowledge, and who fancy the secrets of nature are unfolded before our gaze, are less wise, it would seem, in turning coal to account than were the ancients. We have not practised what they had been told. We seem to be unaware that water applied to the coals will make them light better; we do not try coal mixed with wine (as did some of the Romans) as a cure for the toothache; we do not mingle coal dust with water to form the best of hair washes, or wear a piece of coal in a ring to keep off evil spirits, and, finally, he is afraid we are blind to the circumstance that if the home fire will not burn whilst we are wishing our wishes will pass into realities, and remove from dreamland.

The history of the utilisation of coal in this country is traced in the most amusing and instructive manner throughout, and although there may be some question whether the reference in the Saxon Chronicle to the Abbot of Peterborough's lease does not refer to charcoal rather than mineral coal, unless the language very plainly indicates the latter, Prof. Wiltshire has been careful generally not to let his desire to make his lecture amusing induce him to sacrifice accuracy, and, in the result, has produced a memoir which will no doubt be very widely and profitably read.

\* "The History of Coal." By the Rev. THOMAS WILTSHIRE, M.A. F.G.S., &c. London: E. and F. N. Spon, Charing Cross.

#### REGULATING THE SPEED OF STEAM-ENGINES.

With a view to cause steam and other motive power engines to work at a uniform and regular speed an additional apparatus, provided with a moveable weight, is, according to the invention of Mr. A. Denis, of Paris, adapted to the ordinary governor for the purpose of rendering it more sensitive, and to cause it to act with increased quickness on the throttle or slide valve which governs the induction steam. The apparatus, which the inventor calls a moveable counterweight compensator, is so constructed and arranged that it may without difficulty be adapted to existing engines, and without altering or removing any of the parts of the latter. On the spindle of the ordinary governor, which is actuated in the usual way, is keyed a spur wheel, which gears into and drives a second toothed wheel, mounted on a vestical spindle, fixed in a bracket, which is bolted or otherwise secured in any convenient manner to the framing of the engine. Immediately above the end of this spindle there is a pendent bearing fixed in the upper end of the bracket for the purpose of receiving the spherical end of a pendulum or swinging shaft, so as to form a kind of universal joint.

A spherical weight is keyed on this swinging shaft, and the lower end of the latter passes through a radial slot made in the second toothed wheel above mentioned. Below this wheel there is a third wheel, provided on its periphery with external teeth or notches, and below this wheel there is a fourth wheel, provided on its periphery with internal teeth or notches. The teeth or notches of these two wheels are on the same horizontal plane, and there is sufficient space between them to admit of the lower end of the pendulum or swinging shaft being carried round by the second wheel above without touching the other wheels. This will be the case when the pendulum wheel is rotating at its normal speed, but if this speed either increases or diminishes the pendulum will either fly out into the notches of one wheel or drop back into the notches of the other. The third wheel is mounted on the upper end of a sleeve, which turns freely on the central vertical spindle, and carries at its lower end a bevil toothed wheel. A similar wheel is cast on the under side of the fourth wheel, which turns freely on the sleeve of the third wheel, so that these two wheels are capable of independent rotary motion in opposite directions, and their two bevil wheels both gear into an intermediate bevil wheel mounted on a screwed shaft, which turns in bearings in the bracket frame.

A horizontal rocking shaft carries a lever, which is connected with the throttle valve or slide valve of the engine, and on this shaft is keyed a double-armed horizontal lever, on each of the ends of which is mounted a ball or spherical weight of exactly the same size and gravity, and the same distance apart from the rocking shaft. One of these weights is fixed, and the other is capable of being moved along its arm of the lever. To effect this motion a cross pin is fixed in the ball, and its ends are received in round holes at the ends of a pair of horizontal rods, which at their other ends carry a screwed block through which the screwed shaft passes. It will now be understood that if rotary motion be imparted to this shaft by means of the bevil gear at its inner end (as already explained) then the second block will be moved backward or forward, as the case may be, and will cause the moveable spherical weight to move along its arm, and thus destroy the balance of the double-armed lever, so that the rocking shaft on which it is mounted will rock, and thereby actuate the throttle or induction valve of the engine.

#### DON PEDRO NORTH DEL REY MINING COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The hopes held out to the shareholders in this great mining undertaking are approaching realisation, as the following extracts from letters written by the different previous managers of the mine will explain. In the year 1868 Capt. Treloar, who was then manager of the property, writes:—"The Maquina lode we have proved in depth improves in quality; the mine captains are of opinion that the lode is increasing in richness as we descend." Again, the same year, he writes: "In the bottom of the mine the general body is rich for gold and buncy in character, but on the whole no such auriferous ground has been discovered in Maquina." In the following year the four mining captains in their joint report write: "Stopes in descending have gradually improved in quality, but latterly from excess of water have been suspended; we fear they will not be worked again until a proper system of drainage has been adopted." And Capt. Treloar, in his annual report, says: "In my opinion it will be impossible to follow the lode much further by animal power; the powerful machinery must, therefore, be erected with all possible dispatch." Mr. Simmonds, the subsequent manager, writes: "The curve has not yet been worked on this year; from this splendid body of lode the greatest portion was extracted in 1868 and 1869, and consequently it needs no further demonstration to prove the reason our produce has fallen off. . . . When the mine is drained and we have these rich stopes to work on I may be allowed to prognosticate good returns, which will enable commensurate profits to be declared." The four mining captains in their annual report for the same year commence by saying: "Water has been the chief obstacle to obtaining the brilliant results which in previous years attended our operations." The mine has now been drained by the powerful pumping machinery. The rich stopes referred to in the above extracts have become available, and the lode has been intersected very rich at a greater depth, and the dividends will no doubt shortly be resumed. JOHN S. HOUSTON, Crosby Hall Chambers, Jan. 16.

[For remainder of Original Correspondence, see to-day's Supplement.]

#### Meetings of Public Companies.

##### HULTAFALL MINING COMPANY.

An extraordinary general meeting of members was held at the offices of the company, Austinfriars, yesterday (Mr. GEORGE BATTERS in the chair), for the purpose of passing the following resolution, or such modification thereof as might be agreed upon:—"That the directors of the Hultafall Mining Company (Limited) be, and hereby are, requested and authorised, in pursuance of the borrowing powers conferred upon them by the 73rd clause of the Articles of Association, and every other power enabling them in that behalf to borrow upon debentures secured upon the company's mines and property, or some portion thereof, or otherwise as they may think fit, a sum of not exceeding 10,000l., upon 5000l. of which interest shall be payable at the rate of 5 per cent. per annum, and on the remaining 5000l. at the rate of 7 per cent. per annum."

MR. LAYINGTON (the secretary) read the notice calling the meeting. The CHAIRMAN said: Gentlemen, when last we met this question of how to get out of debt, and to provide money for carrying on the works, was discussed, and in the main the idea that is now laid before you was agreed to. At that meeting two classes of debentures were proposed, one bearing interest at 5 per cent. and the other at 7 per cent., inasmuch as some of the shareholders present thought 5 per cent. was too low a rate to pay to the general body of shareholders on the security of mining property, however good it might be. On the other hand, the Messrs. Maxfield, who had really found the money to carry on the works, and to whom the company were indebted, were willing to take out their indebtedness in 5 per cent. debentures, their desire being not to increase the capital of the company, and not to clog the company with any liability which the shareholders would feel to be upon them, or a burden likely materially to affect their interests. In pursuance of the wish of the general body of shareholders the directors met, and agreed to call this present meeting, and ask you to pass the resolution which you have just heard read: 5000l. of debentures will be taken up chiefly by the Messrs. Maxfield, and it is proposed to offer the other 5000l. of debentures, or a portion thereof, to the general body of shareholders, and I am sure one and all will feel it to be their duty, as well as their interest, to come to the help of the gentlemen who have already done so much for the company. Mr. John Maxfield, who attended our last meeting, and stated that for the sum of 1500l. of what he called fresh money—that is, money to be expended in working the concern until the navigation opens—he could see his way to bringing the mines into a good paying condition, because the difficulties in the dressing department, he considered, had been perfectly mastered by Mr. Tannatt, the gentleman sent out by Capt. Williams, of Van, who considers him to be a good miner as well as a good lead dresser, and in the interests of the economical working of the mine Mr. Tannatt is acting not only as our lead dresser, but also as the captain of the mine. In the last letter which they had received from Mr. Tannatt he described the mines as being very rich indeed, and that he could see no reason at all why they should not pay very splendidly for lead, even if we give the blende away, and there are thousands of tons of lead ore already laid open. There can be no doubt as to the value of the property, and now that the difficulty of dressing is over it would appear to be plain sailing for the company, provided the shewers of war are supplied in the form of the small amount now sought to be raised. If only 3000l. is subscribed out of the 5000l. now proposed to be offered, there can be no doubt that it would carry the company through, and place them entirely out of debt up to the opening of the navigation, when sales of lead and blende will be regularly made. I may state that the Messrs. Maxfield, who held a portion of this mine originally, took payment for the same wholly in shares, and they have not sold a single share nor put one penny in their pockets from the proceeds of the moneys raised by the present company; the whole has been spent in erecting the machinery and working. Not only have they not sold a share nor put money in their pockets, but they have advanced a very large sum, and still are prepared to stand with their backs to the wall to see Hultafall a secured success; and, as a proof of it, one of those gentlemen, Mr. John Maxfield, leaves for Sweden by to-morrow's boat, where he intends remaining for the greater portion of the present year, feeling that the interests of the company are best secured by a personal supervision. There is one matter to which I should have liked to have alluded to to-day immensely, in the interests of this company, and which, I think, will eventually be beneficial in placing the concern second in importance to no company of its kind; but in the interest of all concerned, I think it would be better if I said nothing whatever upon that head to-day. Let the shareholders, however, rest assured that their interests are being protected and carefully watched, and there is something good in store for them over and above the acquisition of that property which the company was originally started to work. The price of lead and blende is very much against our working, but in that respect we are better off than many. Our lead contains about 30 ozs. of silver, which would ensure our getting about 14l. per ton even at the present wretched state of the lead market, and our blende also contains a percentage of silver. Our secretary, Mr. Layington, sent down samples the other day to our Welsh friends. I have in my hand an assay of the blende for silver, and I am happy to say it contains 6 ozs. of silver in the slimes, and 8 ozs. of silver in the rough blende. This is a question of some importance in an article like blende. I think the shareholders are in possession of all the information which they could possibly require as to the position of the mine, and the state of the company generally, and I can only say, in conclusion, that the directors of the company are firmly of opinion that the present summer will no doubt see this mine in a state of great prosperity and profit, and certainly for this the company are greatly indebted to Messrs. Maxfield. It is no common sacrifice in the depth of winter for a gentleman to go out to Sweden and take up his residence in a cottage on the mine in the fulfilment of what he believes to be a duty—that is, protecting our interests, and seeing that the very best is made of this very highly interesting property. What the directors expect from the shareholders now is some slight co-operation, and that they will come forward and help in taking up the debentures which will be offered to them, bearing interest at 7 per cent.; and although nothing has been yet decided by the board as to the redemption of these debentures, the idea is at present that the debentures should be issued for 10 years, redeemable at 110l. by drawings. The whole sum of money required to pay the interest, assuming the whole are issued, would be only 600l. per annum. The trustees for those debentures would be chosen from the present existing body of shareholders, or placed in the hands of two or three directors. However, that was a matter of detail, which we shall ask you to leave to the board. Circulars will be sent round, and the bonds will be issued as early as

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Gadd's experience of the inner working of this and other large corporations has led him to decide to devote his time to matters connected with public companies and the investigation of their affairs in the interest of shareholders and creditors.



## ABRIDGED PROSPECTUS.

# The Rhine and Moselle Mining Co.,

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Under the Companies Acts, 1862 and 1867, with Limited Liability.

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W. C. PARKINSON, Esq., Cottage-lane, City-road.

SECRETARY (pro tem.)—Mr. A. H. CARLEY.

OFFICES,—4, NEW BROAD STREET, LONDON, E.C.

This company is formed to purchase and work the mining concessions of Aurora, New Weisweiler, and Marienberg, of which the first is adjacent to the well-known and rich mines of the Bensberg and Seigen districts, near Cologne; and the latter two are on the strike of the great and productive lodes which cross the Rhine and Moselle from Nassau to the Eifel—the New Weisweiler being near the village of Tries, and the Marienberg at Ravensburen near Enkirch, both on the Moselle.

I.—The Aurora consists of numerous Government concessions, now forming one consolidated grant in perpetuity of 5140 acres, or about 8 square miles, a mining field of unusual magnitude, subject to a royalty of 1.50th only. Eight known parallel lodes traverse the set, three having been laid open at shallow levels only, from which a very large quantity of lead ore has been raised and sold.

It will be seen by reference to the reports that the indications of further discoveries of ore, equal to those which have already yielded so largely, are numerous—without reckoning the more distant, and, according to analogy, more prominent points, both in depth and longitudinally, at the junction of the lodes.

The local manager, Mr. Otto, says, in his report on the Aurora Mine:—"Although the work of laying open the mine cannot be said to have been largely done there exists, nevertheless, reserve stopping ground to the extent of 3000 to 3300 square fathoms ready for removal, representing 2750 tons of ore in sight."

This quantity remains after the removal and sale of 4482 tons of lead from the adit and 16 fm. levels only, but chiefly from the adit, an unusually large quantity having regard to the shallowness of the workings. He adds "that the adjacent Silberkaule Mine has of late so increased its returns that it at present produces monthly 180 tons of lead ore, and the Mine Castor, to the north of Aurora, produces monthly 225 tons of lead ore."

Mr. Nauester, the manager of extensive mines at Bensberg, says:—"In regard to the lodes (of Aurora) in depth it may be stated that in many mines of the neighbourhood depths from 110 to 160 fathoms have been obtained and witnessed to a regular continuance of the ore deposits going down, although interchanging now and then with barren portions. My opinion is, therefore, that lodes like No. 4 and No. 7, which have shown such rich courses of ore are not likely to have reached their limits of productiveness, neither in their horizontal or vertical continuation; but, on the contrary, that further discoveries may, with a considerable degree of certainty, be expected."

Capt. Toy, of Llanidloes, who has inspected this mine, says:—"Looking at the very extensive set, containing eight well-known lodes, the shallowness of the mine, with little water to pump, congenial strata, and large reserves, the prospects are more than ordinarily good, whilst its facilities for rapid and economical development make it one of the most promising and desirable fields for mining enterprise that I know of."

II.—The New Weisweiler comprises a concession in perpetuity at a like royalty of over 1100 acres, or nearly two square miles, the explorations in which are confined to the discovery of a splendid lode, carrying a solid leader of lead and blende, and presenting great facilities for working it speedily and economically.

In reference to this discovery, Capt. Toy says:—"I have been a miner 50 years, and in different parts of the world, but in all my travels I never before saw such a fine-looking lode so near the surface, and I consider the prospects to be exceedingly good. It is eminently entitled to a vigorous and sustained prosecution, which, if properly carried out, cannot fail in my judgment of giving great and lasting profits."

III.—The Marienberg embraces in a set in perpetuity at a like royalty, 185 acres, and is traversed by numerous powerful lodes, productive of silver-lead ores, yielding in silver 26 ozs. to the ton.

Speaking of this mine, Capt. Toy says:—"Looking at this set, I find that much work can be carried out, and a large area of land proved to a depth of 40 fms., without the aid of steam power."

The acquisition of these mines has been made on terms which some three or four years since would have been impossible.

As it respects the Aurora Mine, the great outlay in the erection of buildings and machinery, and the heavy expenditure in the long drive in the search for and development of the lodes, together with a wasteful system of dressing, absorbed the bulk of the rich produce; and death amongst the proprietors having taken place, a sale became inevitable.

The purchase money is £18,000—£7550 in cash, and £10,250 in shares.

Of this amount a net return from the reserves of lead in the Aurora Mine alone of £2850 is immediately available, representing, therefore, upwards of 40 per cent. of the purchase money; whilst the magnitude of the set, its numerous and but slightly developed lodes, its buildings, machinery, and plant, together with the valuable sets of New Weisweiler and Marienberg, are very inadequately represented by the balance.

It is estimated that the lead reserves at Aurora will provide a steady and satisfactory dividend, pending the opening out of the many promising points referred to in the reports, and the development of the splendid discovery at New Weisweiler.

The directors base their remuneration upon a percentage on the net profits of the workings.

Application for prospectuses and shares to be made to the directors, at the offices of the company, No. 4, New Broad-street, London, E.C.

The LIST will be CLOSED for LONDON THIS DAY, Jan. 18th, and for the COUNTRY on MONDAY, Jan. 20th.

## WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,  
MINEOWNERS, STOCK AND SHARE DEALERS, &c.  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

Ten years ago the weekly information which had previously been published for a great number of years in WATSON BROTHERS' Mining Circular was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementines Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and sharedealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

GREAT LAXEY has been one of the most successful mines of the day. In the year 1863 it was formed into a limited company in 15,000 shares of 4s. each, and has paid nearly 300,000l. profit to the shareholders, in addition to the fact that the shares also rose from 4s. to 20s. each. The mine is under local management, and the chairman and managing director has given it, as we have always understood, his close attention and personal supervision; in fact, so long as we have known anything of Great Laxe, and that is ever since the company was formed, the chairman has been its Alpha and Omega. And we are under the impression that it has redounded very much to his credit. But no one, however, must criticise or offer opposition to any proceeding in regard to the mine without being called to order. It is—"I am Sir Oracle, and when I open my lips let no dog bark." Now, in the *Mining Journal* of Nov. 2 (page 1222) a shareholder called public attention to the accounts of the company, and stated that "the Chairman seemed to look upon the reserve fund merely as a machine for equalising dividends." Who his shareholder is we do not know, but his letter was never answered, and more than one enquiry has since been made regarding the mine and its dividends; so in the *Journal* of the 4th instant we stated that the mine "was annually inspected for the Crown, but its management was entirely local, and almost personal." Now, in this there was certainly nothing personally offensive, but rather the contrary, because if the management of the mine, as we believed, was more particularly looked after by the resident director with such good results the credit was his, and the directors as a body are responsible for the accounts issued to the shareholders.

However, on the 7th the secretary of the company wrote us, calling attention to our remarks, and demanding a "prompt" explanation of the words "its management is entirely local, and almost personal"; a "statement," he added, "not correct, and to say the least of it, very misleading." Our reply was that if he would point out how our remarks were "incorrect or misleading" we should be happy to put them right.

In the meantime, let us refer back to the letter of a shareholder, and the accounts themselves, a copy of which we obtained as soon as we got the secretary's letter. The shareholder challenged the Chairman, or even the most experienced accountant in England, to tell from the statement of accounts sent out by the directors on Sept. 25 last what the profit had really been for the half-year ending Aug. 2, although 12,000l. had been paid in dividends. He could only make the profit, he said, 6349l., and asked, first, why the directors had, therefore, divided 12,000l., and, secondly, in the face of a falling market for lead, why had they on Oct. 8 declared another dividend of 4500l. He then referred to the reserve fund—5228l.—as insufficient for a mine whose expenditure was 4000l. a month, and that it seemed to be looked upon mainly as a machine for equalising dividends. This letter appeared in a prominent part of the *Mining Journal*, and has never, that we are aware of, been replied to or noticed.

Let us now examine the accounts for ourselves, and in doing so we look upon them as the accounts of the directors as a body, and not as "personal" to any one. They are for six months ending Aug. 2, and show costs for that period 24,266l. 18s. 10d. Among the items are office expenses, secretary, &c., 380l. 10s. 2d.; directors' fees, 250l.; law charges, 205l. 8s. 8d.; interest allowed on sale of ore, 162l. 8s. 9d.; bank commissions (discounting), 201l. 19s. 9d.; directors' travelling expenses, 66l. 10s.; bank interest and commission, 88l. 2s. 1d. The dividends declared are given at 12,000l., making the total of expenditure 36,266l. 18s. 10d. The actual ore sales on the "income" side are—lead ores, 5552l. 10s.; blende, 24,510l.; total, 30,062l. 10s.; thus showing a profit of only 5555l. 11s. 2d. Credit, however, is taken as "income" for 400 tons of lead "still in store" on account of depressed state of metal market; estimated value 13l. 10s. per ton—5400l. At the time these accounts appeared, early in October, lead had become even more depressed. Two months' costs, amounting to 8000l. according to current rate, had been incurred, and yet, as a shareholder observed, another dividend of 4500l. was declared (Oct. 8) just one day before the general meeting to be held in the Isle of Man. In the statement of assets and liabilities credit is taken for the 400 tons of ore in stock—5400l. the other assets, as pointed out by a shareholder, exclusive of reserve fund, were only 7393l., against 8935l. liabilities. In the statement of expenditure for six months there are these items—Merchants' bills, 2879l. 0s. 6d.; royalty, 2969l. 10s. 11d.; freight and insurance on ores delivered, &c., 2804l. 18s. 10d. And in the list of liabilities under these three heads there remains unpaid and due 8033l. 10s. 4d. These figures speak for themselves; and another dividend of 5s. per share (3750l.) has just been declared.

WHEAL CREBOR.—The 108, or pioneer level in the new ground, is between two great courses of ore—that in Old Crebor and that in Crowndale,—and its daily improvement may lead to a discovery of importance.

MR. WILLIAM H. H. WATSON having had some years' experience in Practical Engineering and Mining in Cornwall, as well as two years' practice in the London Stock and Share Markets, begs to offer his advice and services to Shareholders and Intending Investors in Mines, and in the Purchase and Sale of Shares.

Address: W. H. H. WATSON, 1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON, E.C.

## Mining Correspondence.

## BRITISH MINES.

ABERLYN.—John Roberts, Jan. 15: The men of the rise, and also the men in the No. 2 adit, have been engaged this week in opening the ground in the end of the rise at the bottom of the No. 2 adit, so as to give room for cutting through the lode and give greater facility for breaking blende. The lode looks well. The winze in the No. 1 is without any change, and quite as good for blende as I have ever reported it. We have made some progress this week on the surface. We shall have finished the upper flooding by Saturday, and next week I hope to get the tramway of the deep adit forth over it ready to tip down the stuff from the No. 2 adit. I hope that to-morrow we shall get all the machinery on the mine, and no time will be lost in getting it erected.

BEDFORD UNITED.—Jan. 16: The 127 east has recently improved, and is now worth 3 tons of ore, or 9l. per fathom. The 138 is now producing saving work, and promising a further improvement. A slight falling off in our principal stopes, and the severe weather of the last three weeks, have somewhat interfered with our usual returns, but as the spring advances we anticipate there will be no falling off in our samplings. The mine generally is looking very well, and with a better price for copper our prospects would be much improved.

BLAEN CAELAN UNITED.—J. Pell, Jan. 15: The frost broke up sufficiently to commence pumping yesterday. The men have taken down several feet of the lode in the cross cut driven north of the 20; it contains some excellent lead. The water having filled up the engine shaft and winze to the 20 we have commenced dropping lift of pumps to save the further expense of manual labour in drawing the water. The cross-cut at the bottom of the engine shaft is sufficiently advanced, enabling us to cut down the lode without endangering either the pit works or pumps unless frost intervenes. I hope next week to be able to give the value of the lode east and west from the engine shaft at the 30. No time shall be lost in stripping down the lode. No other change to notice.

BLUE HILLS.—S. Bennetts, P. Bennetts, Jan. 11: The north lode in the 30 east is 3 ft. wide, and worth 1 1/2 to 12l. per fathom. The stopes in the back of this level is worth 8l. per fathom. The sinking of the Blue Burrow shaft is again making fair progress after having passed through a large gossan, and the only one between that point and the 30 east end.

BODID HILLS.—H. Hotchkiss, Jan. 15: I have nothing new to report on in any part of the mine to day, but all is going on regularly, and with all speed possible; the ground in the new shaft is extremely hard, but I expect a favourable change daily. We have not taken down any more of the lode since I advised you last. We have still the same favourable ground in the 45 east.

BWLCH UNITED.—N. Bray, Jan. 11: Very little has been doing in sinking Ritchie's shaft below the 90 for the month, owing to the very severe frost and snow, which have completely filled up our wheel pits, but I have put the shaft-men not employed in clearing water courses, &c., to open a new slope in the bottom of the 60, and so far the prospects are favourable, the lode producing good saving stuff for lead ore. The same may be said of No. 1 stopes (working by four men) to the west, in the bottom of the same level, on a separate shoot of ore. I need not say immediately the weather moderates every attention will be paid to the sinking of the shaft, which is the primary object.

CLEMENTINE.—John Roberts, Wm. Sandoe, Jan. 15: We have completed everything at the shaft, casing, dividing, fixing ladders, &c., to the surface. We have commenced building the stand for the water-wheel, and the wheel is on the quay at Trefriar, which will be brought on the mine directly. The stopes in the adit level is looking very well.

COMBARTIN.—T. Comer, Jan. 16: We are pushing on the cross cut adit with full force; the ground is very congenial, and we are daily expecting to cut into something good. Fair progress is being made in driving the adit level north-west. The lode is about 4 ft. wide, producing lead and blende saving work, and the end presents every appearance of being near a good deposit of lead.

D'ERESBY COBOLLS.—J. Roberts, W. Sandoe, Jan. 15: The lode in the end driving towards Cobol's lode is a little deeper in the bottom of the end, and as though we should have another year. There is no other change.

D'ERESBY MOUNTAIN.—J. Roberts, W. Sandoe, Jan. 15: The lode in the sump at No. 1 contains more blende, but is not quite so good for lead. The water is getting rather too quick to make much speed in sinking, and we think it would be advisable to suspend it till No. 2 is driven to unwater it, which may not be a great distance, as the lode is a porous one. The lode in the rise at No. 3 is not quite so ore, but easier for raising. The men in the stopes at No. 4 are for a day or two engaged in clearing down the top of the pile of stuff so as to get to other ground further down which is more productive. We have not been able to do anything in the sump to No. 5. We have put in the timber about the top of the new shaft over the sump at No. 4, and the water is so quick between the debris and the rock that we are compelled to bring in a drain to let it go. In No. 5, on to the north end of No. 2 shaft, owing to the frost, the level had got in a rather dangerous state, which compelled us to put the men back and secure it, which will take a few days to do a good job by it. The frost having broken up, we commenced crawling again on Monday afternoon, and are making the most of every day. We put a nice pile of lead in the bin to day, and shall do the same to-morrow, and we have a good pile of lead at No. 1, which we shall bring down directly, and will not require so much treatment as the coarser stuff from No. 4. We have also a tolerable good pile at No. 3, which we shall also bring down, which will soon be put into the bin.

DERWENT.—J. Morphet, Jan. 16: We have no very notable change in any of our underground workings.—Jeffries' Shaft—Middle Vein: The 98 east is without change. The value of the stopes in the back is 15, 15, 15, and 18 cwt. of ore per fathom respectively, average width of vein, 6 1/2 ft. The flats are coarser, worth at present 14 cwt. per fathom. The rise in the back of the 99 west, at the extreme end, is in very hard ground—rises only 2 ft., and at present poor. The stopes in the back of the same level yield 15, 15, 15, and 19 cwt. of ore per fathom respectively, the vein averaging in width 4 ft.—Sun Vein: The stopes over the 70, west of shaft, continues poor. The 70, east of shaft, yields 9 cwt. of ore; the vein is 2 ft. wide, and the stopes in back of the same is worth 13 cwt.—Westgarth's Shaft: Middle Vein: The sump under the 93, east of shaft, going towards the rise over the same level, west of Jeffries', is down 3 1/2 ft.; the ground is extremely hard and slow to shift, and poor, being, we think, of mainly to one side of the vein. The 74 is without change. The stopes in the back produce 14 cwt. of ore per fathom—vein 2 ft. wide. We had a nice thaw in the last few days, but frost is keen this morning again. Drawing every day, and dressing too now, except some of the finer and frozen slimes.

EAST DARREN.—Jan. 15: In the cross-cut, south of Taylor's shaft at the 104, the ground is becoming a little harder for exploring. In the 92, east of cross-cut on south lode, the lode is 3 ft. wide, containing small branches of lead ore. In the 92, east of cross-cut on No. 2 branch, the lode is 5 ft. wide, yielding 14 cwt. of lead ore per fathom. In the 80, west of cross-cut on south lode, the lode is 3 ft. wide, yielding 12 cwt. of lead ore per fathom. In the 80, west of cross-cut on No. 1 branch, the lode is 1 1/2 yard wide, a little improved, and yielding saving work for dressing. In the winze sinking under the 80, east of cross-cut on junction, the lode is 5 ft. wide, worth 1 ton of lead ore per fathom. The machinery is in full working order, and the drawing, with dressing, of ore pushed forward since the favourable change in the weather which set in on Monday last.

EAST YAN.—W. Williams, Jan. 16: I have no change to report from here this week. We have crossed 8 fathoms north at the end of the 70, but have not yet reached the footwall. The cross-cut from the north lode is driven 2 1/2 fms.

GAWTON COPPER.—George Rowe, G. Rowe, Jan. 11: Since making the communication with the 117 our men have been principally engaged in stopping down a piece of ore ground both east and west of the winze sunk below the 105, where the lode is worth 10l. and 12l. per fathom. Also taking down a piece of ore ground to the west of the winze sunk below the 95, where the lode is worth 10l. per fathom. All other points are without change.

LENNY.—R. Rowe, Jan. 16: We are pushing on the cross-cut down to the extent of the last pump added on to the lift, and shall then cut a small ledge, and sheath the shaft down for drawing at that point; the lode is still very large, with good stones of blende, and some little lead has been seen in the quartz during the week. No change in the cross-cut.

GREAT RETALLACK.—T. Harris, Jan. 13: The lode in the end of the level, driving west from the bottom of boundary shaft, continues of much the same nature as when last reported, the ground being principally of light peach, with good lumps of blende embedded in it.

HENGLISTON.—T. Richards, Jan. 16: Bailey's Shaft: In the 172 east the lode contains capel, quartz, mundle, and copper ore, worth 3 tons or 6l. per fathom, and although not producing quite so much ore is exceedingly promising. In the 173 west the lode is without important change, being composed of capel, quartz, mundle, and stones of copper ore. In the stopes in the back of the 173 east the lode is worth 6 tons of ore or 15l. per fathom. In the 160, west of Nicholls' winze, the lode is large, producing a little ore, and is promising. In the tributary stopes and pitch in the back of the 110 continues to be worth 6l. per fathom. In the branch pit a branch has been run in, containing capel, quartz, and mundle, with black and yellow copper ore intermixed. I would remark that this branch is underlying northward, and is probably connected with the Clitter lode (which is underlying to the south) between the present end of the level and the surface.

LADYWELL.—Arthur Waters, Jan. 16: There is no change here to call for remark since my last report. The 16, south of new shaft, maintains its character, and is producing nice bright looking soft galena in a sparry matrix, a feature we like to see in Spherphe lodes. The new shaft is progressing slowly, owing to hard ground. Weather severe, with hard frost begun.

LEADHILLS.—A. Waters, Jan. 17: Tribute pitch in back of the 60, south of Glengoran shaft, by four men, at 90s. per ton. Pitch in back of the 40 shaft, by three men, at 95s. per ton. Stopes in back of the 20 shaft, by four men, at 35s. per fathom and 10s. per ton; lode worth 25 cwt. per fathom. Gripp's level: drive north of shaft, by two men, at 80s. per fathom and 10s. per ton; wide lode, yielding stones of ore. Stopes in back of this level, behind the end, by two men, at 35s. per fathom and 10s. per ton; lode worth 20 cwt. per fathom. Pitch in back of Gripp's south, by two men, at 95s. per ton. Pitch in back of Pottshill level south, by three men, at 95s. per ton.—Muir's Cross-cut: Gripp's level: drive west, towards side lodes, by four men, at 120s. per fathom.—Doble's Vein: Pitch in bottom of Gripp's, by four men, at 90s. per ton; the men here are sinking a winze below level, and stopping the end as they go down; the lode holding out good prospects of success. I think it will be necessary to arrange for some kind of machinery shortly, in order to give this lode a thorough trial.—George Roust Vein: Pitch in back of Gripp's, north of Muir's cross-cut, by four men, at 95s. per ton.—Brown's Vein: The 70, to drive south of Jeffries' shaft, by four men, at 115s. per fathom, and 10s. per ton—a strong, kindly lode, present yield of ore being 30 cwt. per fathom, with every prospect of considerable further improvement. Newbigging's winze, below the 55, about 28 fathoms south of Jeffries' shaft, is down 8 fathoms, and we have driven from the bottom of it north 6 ft. 1 ft. 3 in.; the sinking and driving showing a rich course of ore. The lode along the bottom and back of the said drift is worth 4 to 5 tons per fathom; the end going north at present worth 3 tons per fathom. We purpose continuing this drive north for another month, and then to sink a winze to the 70 in time for the coming up of the level from the shaft; this bargain is let to four men, at 90s. per fathom, and 10s. per ton. No 1 stopes, in back of the 55 south, by four men, at 45s. per fm., and 10s. per ton; lode worth 3 tons per fathom. No. 2 stopes, south of ditto, by four men, at 55s. per fathom, and 10s. per ton, worth 30 cwt. per fathom. No. 3 stopes, south of ditto, by two men, at 60s. per fathom, and 20s. per ton, worth 25 cwt. per fathom. The tribute pitch in back of the 55 north, by two men, at 95s. per ton. The pitch in the bottom of the 30 south, by two men, at 95s. per ton. The 20, to drive south of shaft, by four men, at 90s. per fathom, and 10s. per ton; this end is about 23 fathoms behind Moffat's sump, sunk below Gripp's, is



**PRINCE OF WALES.**—John Andrews, Jan. 15: The lode at Vigar's shaft will

**WHEEL GRENVILLE.**—T. Hodge, Jan. 15: The old lode in the bottom of Gould's shaft is opening out wider, principally of spar, and at times produces good stones of tin. We have not taken down any of the flat lode for some time. The shaft is now down 12 fms. below the 150 fm. level on the latter lode. The 150 ear produces stamping work. We have several fathoms yet to get to and run the tin ground go ne down in the level above. The 140 east end is wor about 7% per fathom, and from the appearance of the lode to day I think we

**SCOTTISH-AUSTRALIAN.**—The directors have received from Sydney, dated Nov. 26. The sales of coal from the Lambton Colliery during November amounted up to the 2nd of that month to 14,400 tons.

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**HOLLOWAY'S OINTMENT AND PILLS.**—The finest remedies in the world for bad legs, old wounds, sores, and ulcers. If used according to directions given with them, there is no wound, bad leg, or ulcerous sore, however obstinate or longstanding, but will yield to their healing and curative properties. Numbers of persons who have been patients in several of the large hospitals and under the care of eminent surgeons, without deriving the slightest benefit, have been thoroughly cured by Holloway's ointment and pills. For glandular swellings, tumours, scurvy, and diseases of the skin there is no medicine that can be used with so good an effect. In fact, in the worst forms of disease, dependent upon the condition of the blood, these medicines, if used conjointly, are irresistible.



### The Mining Market: Prices of Metals, Ores, &c.

Mines in October last after having visited the principal auriferous regions of South America; and his report upon the Uruguay mine was so favourable, and the specimens of quartz which he brought with him have given such extraordinary results that a society was at once formed with a view to work these mines. It is stated that of the 160,000 capital proposed to be raised 110,000, has been

Prices for pig-iron if anything, are reported as being a shade easier at Middleborough, but they have been very irregular, the average price for No. 3 being about \$35. 61., and No. 4 forge generally being accepted at about 94. per ton less than No. 3. The market is not very active, and the principal business is the making time for the want of orders. Likewise at Leeds the markets are stated as being most dull, and the depression very great. There is no difference in quotation between the two places, the orders executed are very few. The markets at Sheffield, according to the public press, are somewhat more active than at the other two places, the general rule, as a fair number of orders are said to be on makers' books; and the prices, however, keep very low, so that there is little if any margin left for profit.

	Ores.	Regus.	Ingots.	Barilla
Liverpool.....	40	1,422	21,143	—
Swansea.....	2130	—	2,062	—
<b>Total.....</b>	<b>2170</b>	<b>8750</b>	<b>23,804</b>	<b>—</b>

Representing about 28,180 tons fine copper, against 24,555 tons Dec. 31; 17,143 tons Jan. 15, 1878; 14,624 tons Jan. 15, 1877; 12, 44 tons Jan. 15, 1876. Stock of copper contained in other foreign ore and Spanish precipitate, 2475 tons fine. Stock of Chili copper in Havre, 5116 tons fine, against 7110 tons Jan. 15, 1878; stock of Coro Coro barilla in Havre, 1900 tons fine, against 1050 tons Jan. 15, 1878; stock of Chili copper afloat and chartered for to date, 12,00 tons fine, against 11,000 tons

Mines in October last after having visited the principal auriferous regions of South America; and his report upon the Uruguay mine was so favourable, and the specimens of quartz which he brought with him have given such extraordinary results that a society was at once formed with a view to work these mines. It is stated that of the 160,000 capital proposed to be raised 110,000, has been



1 VENTILATION OF COAL MINES, 2d.



### Notices to Correspondents.

\* \* \* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

Received.—"C. S. R." (Colorado)—"P. W." (New York): We will endeavour to procure the particulars—"B. S." (St. Clair): Yes—"Old Subscriber" (Richmond): We could not publish such a communication. It would provoke endless discussion, without any possible practical result—"Shareholder" (Guernsey): Perhaps next week—"J. G. M." (Bodlids):—"Shareholder" (Wheal Grenville)—"Stannum" (Penzance)—"J. L." (Carlisle)—"S. R." (Dundee)—"Constant Reader" (Bath): The particulars appear in another column—"Eusid" can have his copy by sending for it—"W. T." (Skibbereen)—"Australasian"—"Shareholder" (Court Grange)—"L. B." (Berlin)—"Inquirer": The office of the Moonta Copper Mine is in Adelaide, South Australia. A letter addressed to the Secretary will obtain all the information you require.

## THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, JANUARY 18, 1879.

### OUR EXPORTS.

Considering the depression in almost every branch of industry which prevailed during 1878, the exports for the year are fully as favourable as could be expected when compared with previous years. In iron, wrought and unwrought, there has been a falling off, whilst in machinery and engines there has been an increase, as there has also been in the shipments of coal, cinders, and patent fuel. The last month of the year appears to have been about the worst, for the exports of British and Irish produce and manufactures amounted to only 14,661,029, against 15,977,799, being a decrease of 8.2 per cent. as compared with the January of 1877. For the year, however, the total value of the exports was 192,804,334, against 198,893,065, in 1877, being a decrease as compared with the latter year of 3.1 per cent. only. The value of our imports, it may be stated, fell off from 394,273,906, in 1877, to 366,059,610, last year, so that a large amount of money remains in the country as compared with the drain of former years. The exports of wrought and unwrought iron during December was particularly low, being only 149,148 tons, against 173,581 tons in the corresponding month of last year. But there has been a considerable difference in the values, for whilst in December, 1877, the average was 84. 19s. per ton, last month it was only 84. 6s. 8d., the actual money decrease between the two periods being 20.4 per cent., that being the difference between 1,551,682, and 1,235,113. The whole year was far more satisfactory, for the exports were 2,299,223 tons, against 2,346,370 tons in 1877, and 2,224,470 tons in 1876. The respective values in the order given were 18,393,974, 20,113,915, and 20,737,410. The difference in the prices, however, show how indifferent was the trade last year, and how keen was the competition in all descriptions of iron and steel, for in 1876 the average value was 94. 1s. 5d. per ton, whilst in 1877 it had declined to 84. 10s. 7d. per ton, and in 1878 to 84. only. In pig-iron, so far as quantity is concerned, our foreign trade has kept up very well for the year, but prices have gone down considerably. Thus we find that whilst in 1876 the value, as returned to the Board of Trade, was 63s. 10d. per ton, in 1877 it was 57s. 3d. per ton, and last year only 53s. 5d. per ton. Germany and Holland have been the best customers for pig iron, each of them taking a monthly average of something like 20,000 tons, or nearly one half of all that is sent out of the country, whilst singular to say the United States has been taking about 2000 tons a month from us, whilst Belgium and France stand next to Germany and Holland.

In railroad iron of all sorts British India and Australia have taken the lead, whilst Russia has taken from us a fair quantity, although not so much as last year. India and Australia have also taken the largest quantities of bar, angle, bolt, and rod iron. The export of Bessemer rails has been increasing during the last two or three years, and Germany, itself an extensive steel rail making country, successfully competing with us in several of the continental markets, has taken largely from us during the present year. Prices, however, have been very low, whilst even now they have a downward tendency, owing to the keenness of the competition on the part of both home and foreign makers. That but little profit can be made at the present time can be gathered from the fact that English steel rails are being delivered on the Continent at less than 64. per ton. That the iron rail trade is fast dying out does not admit of any doubt, and this is only what might be expected when the little difference in the price of iron and steel rails is taken into consideration. In hardware and cutlery the value of the exports in December was 262,655, against 280,137, for the corresponding month of last year, showing a decrease equal to 6.2 per cent. But, taking the year altogether, the returns are far more favourable, for they give the value of the exports at 3,289,644, against 3,337,754, or a falling off of only 1.4 per cent. Our great rival—the United States—has been one of our best customers during the year, although not quite so good as in the two previous years. Australia, however, stands first, our exports there having been heavy during 1878, and considerably in excess of those for 1877. Very different to our other iron and steel trades is that of engines and machinery, and although in the last month of the year the exports amounted to 553,965, as compared with 563,074, for the corresponding month of 1877, a decline equal to 1.6 per cent., yet the year gives very different results, for the value of our exports was 7,490,461, against 6,728,868, in 1877, an increase in value of no less than 11.4 per cent. This is, indeed, most satisfactory, and shows that however much we may suffer from competition in several branches of the iron and steel trades we still maintain our position with respect to engines of every description, as well as general machinery.

Although the exports of coal for the year show an increase as compared with 1877 of 63,766 tons yet they were less by 815,261 tons than in 1876. Germany appears to be becoming more independent of us every year, and is competing with us in some of the markets in the North of Europe, so that owing to the encouragement given by the Government to the development of the native minerals we must expect to see our exports to that country gradually declining as they have done, the quantity sent from England during the last three years having been consecutively 2,278,905 tons, 2,042,911 tons, and 1,933,036 tons. France is still our best customer, being credited last year with 3,051,726 tons, and there is very little doubt should the authorities think well to make the Seine so that vessels of moderate tonnage could go direct to Paris but what there would be a considerable increase in the consumption of English coal in the gay capital, and purchasable at a much lower price than it has previously been at. The business with Russia has been well maintained, principally in steam coal, there having been sent there during the year 1,271,478 tons, against 1,028,903 tons in 1877, and 1,187,020 tons in 1876, so our relations with Russia so far as coal is concerned cannot be considered otherwise than most satisfactory. So much cannot be said for Sweden and Norway, where there has been a falling off as compared with last year of 122,622 tons—a decline of fully 10 per cent. British India shows a decrease—a difference between 895,963 tons in 1877, and 673,065 tons during last year. It may be said that some extensive coal fields have been tapped in India for the use of the railways in particular, and as these get opened out of course less English coal will be required. To Denmark, Holland, Spain, the Canaries, and Brazil there was a falling off in 1878, but on the other hand a very large increase took place in the tonnage sent to Turkey, the trade with which was greatly interrupted during the early part of the year; the returns, however, give 217,991 tons for 1877, and 334,511 tons for last year. At Malta large quantities of steam coal are kept in stock for the use of the navy, but the presence of our fleet for such a length of time in Turkish waters led to a much larger consumption than usual, so that the quantity shipped to there in 1878 was 429,146 tons, against 278,211 tons in the previous year. Prices of coal, it may be said, have been

going down for some years past, and so low were they last year that profits were entirely out of the question as a rule, but colliery proprietors cannot abandon markets because they do not pay now and then, but look forward to the future being better. The differences in the values for several years past, however, will be seen from the following figures, showing the extent of our exports and their growth, together with the gross value and the value per ton, leaving out fractions:—

Year.	Tons.	Value.	Per ton.
1868 .....	10,987,082	£ 5,437,922	9s. 11d.
1869 .....	10,744,945	5,165,638	9 7
1870 .....	11,702,690	5,638,371	9 8
1871 .....	12,747,989	6,246,133	9 9
1872 .....	13,198,494	10,442,321	15 10
1873 .....	12,617,566	13,188,511	20 11
1874 .....	13,927,205	11,984,621	17 2
1875 .....	14,544,916	9,658,088	13 5
1876 .....	16,299,077	8,904,443	10 11
1877 .....	15,358,828	7,828,497	10 2
1878 .....	15,483,816	7,321,424	9 6

It will be seen that 1868 and the two following years before the rapid advances began that the value of coal was higher than it was last year, yet the former were considered very bad times indeed, and the miners now complain that wages are as low as they were in those years of depression. But it may be said that had it not been for the increased shipments in December last the exports of 1878 would have barely exceeded those of 1877, for in the month named France alone took nearly 46,000 tons more than in the corresponding month of last year, whilst Russia just doubled its tonnage at the same time, and the same may be said regarding Malta.

### THE NORTH OF ENGLAND IRON TRADE.

Cleveland has made up its books for 1878. It was indeed a gloomy year for that not long since extremely prosperous and vigorous district. The story of Cleveland depression may be told in very few words. Pig-iron had fallen at the close of 1878 to 31s. 6d. per ton in Cleveland, and it does not require a very powerful intellect to establish the stern pitiless fact that at such a price the manufacture of pig is carried on at an infinitesimal profit—if, indeed, at any profit at all. However, Cleveland may still be said to have put a bold face on matters in 1878. No fewer than 13 blast-furnaces were blown out in the district in 1878, and yet the production of pig-iron for the year was maintained at 2,023,000 tons, as compared with 2,124,831 tons in 1877. The past may be said to be the first year in which there has been a diminution in the production of Cleveland pig, which until 1878 grew steadily year by year. The wave of Cleveland prosperity has thus sustained a check, and is even slightly on the recoil; nevertheless, the reduction in the production noted for 1877 is less than might have been anticipated, perhaps, under all the circumstances. We must not, however, overlook the fact that stocks of pig increased in Cleveland in 1878 to the extent of a few thousand tons.

The exports of pig from Cleveland experienced a slight increase last year; thus they amounted to 335,000 tons, of which Germany took 150,000 tons, France 60,000 tons, and Belgium 50,000 tons. It is curious to find that, notwithstanding the loud talking which we hear in regard to Belgian competition, Belgium all the while is an importer of no inconsiderable amount of Cleveland pig. The deliveries of Cleveland pig to Scotland in 1878 were 325,000 tons, or 60,000 tons less than the corresponding deliveries in 1877. This result was due to the severe and even bitter competition which has arisen between the makers of Cleveland pig and Scotch pig; in other words, Scotch ironmasters made a desperate effort in 1878 to recover the connection which appeared to be escaping them. Wages were reduced in Cleveland in 1878 to the extent of 15 per cent. at the blast-furnaces, and 10 per cent. at the ironstone mines; but these reductions, substantial as they may have appeared, failed, we fear, to keep pace with the severe and relentless decline in prices by which 1878 was memorably distinguished.

Steel rails were produced upon a large scale in Cleveland in 1878; the great establishment of BOLCKOW, VAUGHAN, and Co. (Limited) alone turned out 75,000 tons. This enterprising—and marvellous to relate in these times, still comparatively successful—company is endeavouring to still further increase its production, and expects to carry it shortly to something over 100,000 tons per annum. But even steel rail making is carried on in Cleveland under very depressing conditions as regards prices, the quotations for steel rails having fallen off in Cleveland in 1878 from 74. to 54. 15s. per ton. Experiments are proceeding with the view of eliminating phosphorus from Cleveland iron, so as to adapt it for the production of steel. Should these experiments—which are being prosecuted more particularly by Mr. I. LOWTHIAN BELL, M.P., and Messrs. BOLCKOW, VAUGHAN, and Co. (Limited)—be crowned with success the value of Cleveland iron will obviously be rather materially increased. The great thing now needed in Cleveland is better prices for the iron and steel manufactured. Wages and raw materials have fallen, and so far the Cleveland ironmaster has obtained some relief. Still, with raw pig at 34s. 6d. to 35s. per ton, and with steel rails at 54. 15s. per ton, it is clear that the production of iron and steel is being carried on in Cleveland under very serious difficulties, and very depressing conditions. The one element of hope in an extremely dreary outlook is the possibility that low prices will eventually stimulate consumption to some extent. Should this anticipation be realised this year, the whole of the wonderful Cleveland group would be enormously benefited. Meanwhile Cleveland ironmasters have endeavoured to turn even adversity to good account, and have cheapened, simplified, and improved several details of their operations.

### COLLIERY EXPLOSIONS IN SOUTH WALES.

Whilst the enquiry into the cause of the explosion at the Abercane Colliery was being proceeded with, and evidence given showing that previous to the catastrophe a large quantity of gas was given off in at least one district, the public is again appalled by the announcement of another fearful explosion, with a loss of about 62 lives. The valley of the Rhondda has thus added to its unfortunate reputation for mining fatalities, and how it should be so is a question on which it is to be hoped more light will be thrown than has hitherto been the case with respect to such occurrences, for as a rule the results of the investigations made to trace their actual cause have been most unsatisfactory. Our information, however, as to the explosion at Dinas is as yet but scant, for we are not informed as to the system on which the coal was worked, the lights used, the mode of inspecting the working places, or whether there were safety lamps so made that they could not be opened. But there is the unmistakable fact of a body of gas coming in contact with a naked light by some means or other, and the probability is that we are not likely to be made acquainted with how the two combined together to lead to the explosion, seeing that those who could enlighten us on that point are numbered with the dead. Still we are told that the colliery had been worked for many years, opened out most extensively, and consequently required the most complete system of ventilation, so that the air should reach the furthest places where men were employed. The explosion took place late on Monday night, those who descended being engaged to make the necessary repairs and clear the various working places for the ordinary colliers, who would be in them early in the morning, and we are told that on that day the barometrical readings showed a heavy atmospheric pressure.

The fact of the barometer indicating a change should have led to the ventilation being carefully and vigilantly watched, and no naked lights allowed into any part of the workings. Under any circumstances, as we have frequently pointed out, the ventilation at all times should be such as to render an explosion all but impossible, and that there can be no excuse for not carrying out the special clause in the Act of Parliament requiring that an adequate amount of ventilation shall be constantly produced in every mine to dilute and render harmless noxious gases, so that the roads, working places, &c., shall be in a fit state for working and passing. If this is done an explosion is impossible, excepting, indeed, from a sudden out-

burst of gas from the floor or roof, and where ordinary instead of the best safety-lamps are used. We are informed that the pit for the explosion took place was the one in which the first growth of the Welsh explosion took place in that part of South Wales just 35 years ago, when 12 lives were lost. Since then the works must have been opened out to a great distance in all directions, rendering complete ventilation a somewhat difficult task, requiring the watchful care of a thoroughly experienced practical manager, with a steady and cool head. But it is stated that of late the thorough ventilation of the pits has been deficient, and had led to the attention of Mr. WALKER, the Government Inspector, being drawn to it; and the result was that the late manager occupied the place of overman, and the late overman became the manager, Mr. JAMES MENING, engineer, of Merthyr, being appointed chief. We are not informed of the qualifications of the overman who was appointed manager, or whether he was in possession of a certificate or not, but the change for him must be looked upon as an unfortunate one, seeing that whilst the mine was under his management the explosion took place, involving a loss of 62 lives. With the limited knowledge we have at present with respect to the sad occurrence it would be premature, as well as unfair to those connected with the colliery, to even hazard an opinion as to the cause of the explosion, or to anticipate in any way the inquiry that must take place. We would, however, suggest to the authorities how beneficial it would be were an inquiry to be made into the mode of appointing persons to positions in which they have entrusted to their care the lives of hundreds of men and boys in connection with the coal mines of South Wales. If it is correct that an overman can be appointed manager without undergoing the ordeal of an examination and obtaining a certificate, then the sooner a change is made the better.

### FOREIGN COMPETITION.

A short time since we drew attention to some remarks made by Professor ARMSTRONG, of the Leeds College of Science, with respect to foreign competition and the superiority of some descriptions of American machinery over our own. Foreign manufacturers, it was pointed out, were supplanting us in several of our old markets, and this they are able to do because the working hours abroad are from 20 to 30 per cent. more than they are in England. But our working men are slow to believe anything that tends to destroy the prestige which English manufacturers have so long enjoyed, but which is now leaving them fast, for other nations are now able to produce goods cheaper than we can. Of this we have just had a most telling illustration through the medium of the Times, showing how trades are lost. A Mr. JAMES HILL, a merchant and contractor, took a large order from the War Office for locks, and Colonel WROTTESELY, the Superintendent of Contracts, noticed that they had all been made in America. Surprised to find that this was the case, he wrote to Mr. HILL, and that gentleman replied in a most interesting letter, which ought to find its way to the hands of our intelligent English workmen. In his letter Mr. HILL draws attention to the successful rivalry of American manufacturers in several branches of trade. With regard to the existing distress, pretty well divided between the mining and manufacturing population, Mr. HILL considers that foreign competition has contributed a good deal towards it, but there are other causes which have also helped to bring it about, such as over production, the injurious action of Trades Unions, the drunkenness and improvidence of the working classes, the existence of short hours and high wages, and the antipathy of our workmen to the use of machinery, combined with the obtuseness of the masters who prefer to reproduce the same class of goods from generation to generation, instead of adapting themselves to the advancing ideas of the age. This is certainly a most formidable indictment, but who can say that it is not in most of its clauses really correct. And is it not feasible that if we go on as we have hitherto done, disputing facts that are patent to those at home who have paid any attention to the subject, but even more so to those who have travelled on the Continent and in America. To such foreign competition is a reality, and one that should not be despised, but boldly met in the face by our manufacturers and workmen with a view to meeting it in the most practicable manner possible. This can only be done by the adoption of the best machinery, the greatest economy in production, and by our workmen getting out of the old ruts made by their grandfathers, but which are quite unsuited to the present progressive age.

But it is not only in locks that America is surpassing us, but in many other articles of large consumption in this country as well. Lockmaking, however, has long been an important industry in this country, finding employment for men, women, and children. It is peculiar to South Staffordshire, the principal districts being Walsall, Willenhall, and Wednesbury. Yet we are told by Mr. HILL that he recently supplied all the locks for a large hospital at Walsall, within a stone's throw of the place where locks were made. Yet those locks came a distance of 3500 miles, and could not be equalled in this country. So we find that a superior article coming from America can be sold at a less cost than the inferior article produced in this country. This is anything but flattering to our national vanity with respect to our manufactures, but its truth is above being questioned. The reason given by Mr. HILL for this superiority in some of the American manufactures is similar to that given by Professor ARMSTRONG. In the first place, he states that the Americans employ more machinery than we do, even in the making of locks, whilst English locks are made by hand, with too much of the "rule of thumb" about them. The Americans, both masters and men, according to Mr. HILL, have more technical and general education than we can boast of. Machinery, then, appears to be the great weapon by which the Americans beat us. It appears that we are able to hold our own against France and Germany, where hand labour is the rule, whilst, on the other hand, we are beaten by America, where machinery predominates.

In heavier articles than locks America appears to be treading very fast on our heels. In heavy guns we know that America found the greater part of what was required by the Turks during the late war, whilst the Russian Government was also a good customer to America for war material, and this was caused by the low price and quickness of production. May we hope that these truths as to technical knowledge and the power of machinery which are now being so forcibly pressed upon us will not be lost upon those who are interested in our iron manufactures, but that they will at once set about recovering the ground that has been lost, and so regain the prosperity which for a time has deserted us.

**PIG IRON.**—The following figures, referring to the exports of pig iron from Middlesbrough, prove that foreign competition has not yet reached the raw material:—

1877. 1878.

To Germany .....

Holland .....

Belgium .....

Spain .....

Portugal .....

**COAL AND PATENT FUEL IN THE ROYAL NAVY.**—A return just published contains the results of some interesting experiments recently made on board several of Her Majesty's vessels by order of the Admiralty. Trials have been instituted into the merits of many different kinds of coal and patent fuel, including Australian bituminous and non-bituminous descriptions, Labuan, New Zealand, anthracite, and South Wales coal; the Newport, Abercane, and black vein descriptions, as well as the Aberdare four-foot and East Wylam steam and furnace coal. The Australian varieties were tried on board H.M.S. Pearl, Sapphire, and Sappho, with satisfactory results. The results of the various experiments upon the relative merits of the coal from New South Wales is decidedly in favour of the so-called Bulli Coal, on the score of cleanliness in burning economy, and favourable return of miles run for expenditure. There seems, however, to be some difficulty in procuring this kind, except at Sydney, on account of the preference of the owners of merchant vessels for the Newcastle description, on account of its greater developing power and non-injury from transshipment. Labuan coal, tried on board H.M.S. Curlew and Charybdis, was found good and



economical for steaming at slow speed, but did not answer so well for rapid steaming. The experiments at Portsmouth were conducted with the Welsh, Newport, Abercarn, and East Wylam varieties, with varying results. Among compressed fuels that of Messrs. Heath and Co., the Star Patent Fuel, proved most satisfactory, being described as good and fit for service. All patent fuels, however, have the disadvantage of producing more smoke than the coal of which they are principally composed. The authorities in charge upon makers the desirability of improvement in this respect.

**THE BELGIAN COAL TRADE.**—Some important information, which places the successful competition of our Belgian rivals in the coal trade in a strong light, has just been published by the Minister of Public Works at Brussels. It is based on the official returns supplied by the mining engineers-in-chief throughout the country, and indicates that although work has actually increased and the hours of labour extended the struggle for foreign trade has been carried on partly by reducing the number of colliers employed in the pits and partly by lowering the wages of the others. During the first six months of 1877 there were 287 pits at work, whilst 370 were idle. The average number of working days was 124 per pit, or 129 per colliery during the time specified. The output was 6,394,000 tons, and the number of workmen 98,500, their average earnings being a fraction under 2s. 7d. per diem, the figures for the corresponding period of last year indicate a falling off in the number of workmen, and a corresponding decline in their wages, although their working hours were increased. Thus, whilst 292 pits were in active operation, 383 were altogether idle. Yet during the six months referred to the men, whose number had declined to 98,000, worked 133 days in each pit, or an average of 136 per colliery, there being 161 of those at work as compared with 164 in the first half of 1877. The output had increased to 7,258,500 tons, whilst the day's earnings declined to 2s. 4d. The exports of coal throughout 1878 show an augmentation representing the value of 4,841,000 frs. as compared with the previous twelve months.

#### THE FARMER-WALLACE ELECTRIC LIGHT.

The inauguration of the Farmer-Wallace system of electric lighting was made at the Great Eastern Railway Station, Liverpool-street, on Monday evening, when a number of scientists and electricians were invited to witness the light in use, and to make such investigations as they might deem necessary to determine the practical value of the system, which has lately been introduced into this country under the auspices of Messrs. W. Ladd and Co., of Beak-street, Regent-street, and is now about to be actively worked by the Anglo-American Electric Light Company, which has just been formed with a capital of 15,000l., in shares of 10l. each, of which more than three-fourths has been taken by the subscribers to the Memorandum of Association—Mr. Ladd, who is to act as managing director, taking 250 shares, three members of the firm of Johnson and Matthey 600 between them, the directing engineer (Mr. Henry Edmunds), who brought the inventions over to this country, 250 shares, and the two other subscribers smaller numbers. The fact of men so well acquainted with the subject as the gentlemen mentioned taking so large an interest in the concern is an evidence of their confidence, which cannot fail to be appreciated by less practical capitalists, and it is obvious that the prospects of dividends are much better upon such a capital as that mentioned than upon the amounts which have of late been too common in order to provide for the payment of enormous sums as purchase-money. The stated object of the company is to acquire the agency for the supply or manufacture in Europe of the Farmer-Wallace dynamo-electric light and other analogous machines and patent wire also of the Wallace lamps. The company further take power to acquire certain other patents.

As to the Wallace lamp it is claimed that any number of them can be placed on one circuit according to the power of the current generator, and that as the carbons require less renewal than in any other system there is a considerable saving of time and expense, whilst from their automatic action they are at all times ready. The current has simply to be switched on, and all the lamps in circuit instantly adjust and light themselves, and will burn for 50 to 100 consecutive hours without removal or attention, the cost for carbon being approximately 3d. per hour per lamp, each lamp being of about 800 candle power. The Farmer-Wallace dynamo-magnetic machines are probably the most economic generators yet introduced. It is claimed that they combine lightness, strength, and durability of working parts, and simplicity of construction, and electrically embody the principle of putting into one circuit the field, the armature, and the work, so that according to the amount of work so is the power to drive the machine, thus making it the most economical machine in the market.

By an ingenious device in the armature the heating is reduced to a minimum, and the machines can be run continuously day and night without injury, which has hitherto been the great drawback to all kinds of dynamo-magnets, where an enormous amount of energy is only converted into heat, causing a great deal of strain, and reducing considerably the amount of light. Each machine being duplex can be used as two distinct machines, giving two separate circuits, each circuit producing from one to five lights at the same time, thus making it especially useful for lighting large spaces. The bearings and other working parts are constructed on the best mechanical principles, and may be run for many hours without undue heating, the only parts requiring renewal being the brushes, which may be easily adjusted or renewed by an unskilled person, so that, practically, the only material cost is the power absorbed, which, if taken from a gas engine, need not, it is estimated, exceed 1d. per hour per lamp, and where steam is available the cost is hardly felt. The current generated is said to be capable of supporting a light at a greater distance from the source, and with smaller conducting wire, than any other machines, thus effecting a great economy in cost of lines and accessories.

The derangement of the Wallace lamp is almost impossible, whilst the light is quite as steady as most other lamps seen under similar conditions. At the Liverpool-street Station the light is used in clear glass egg-ended cylindrical lanterns, so that the slightest variation in brilliancy is at once discernible, and hence a comparison, for uniformity, with the Lontin lamp, which is enclosed in ground glass, or with the Jablochkoff, which is enclosed in opaline lanterns, is scarcely fair. This slight want of uniformity is, however, far more than compensated by the great power of the light, six lamps illuminating four long platforms as thoroughly as could be desired. The Wallace lamp has also the great advantage that a single pair of carbons will burn for 40 hours without attention. This is due chiefly to the shape of the carbons, which, instead of being either pencils or circular discs, as in other lamps, take the form of rectangular slabs, each about 6 in. in length and 3 in. in breadth. The thickness varies in the two electrodes, the positive carbon, which is placed above, being about half an inch in thickness, while the negative carbon, placed below, is only about a quarter of an inch thick. These two slabs of carbon are in contact only along one edge. As soon as the electric current passes through them it brings into play an electromagnetic arrangement, which pulls the carbons apart to the extent of about one-eighth of an inch. Across this space the voltaic arc is established, and a light is produced at the point of least resistance between the carbons. The position of the luminous arc may, however, be determined at any desired spot by the momentary insertion of a metallic conductor between two plates. At the luminous focus the space between the plates gradually widens, in consequence of the combustion of the carbons, and the resistance, therefore, increases until the distance is too great for the current to pass, when the arc instantaneously transfers itself to another point, the change being so rapid as to be scarcely appreciable.

The electricity is generated in a small shed at the end of Nos. 10 and 11 platforms, the generator used being the Farmer-Wallace dynamo-electric machine, which produces a continuous current in one direction and is capable of supporting a number of lights in one circuit, according to the amount of power absorbed. The motive power is obtained from one of Robey's semi-fixed engines, which is considered to be one of the most economic engines in the market. It is certainly very compact, and it is claimed that the boiler will

evaporate 20 per cent. more water per pound of coal than the Cornish or egg-ended boiler, and that there is no leakage or radiation from steam-pipe or other large surfaces. The engine pipes are fitted up with all modern improvements, the cylinders are steam-jacketed, and the valve gear is arranged to work with variable expansion. The entire engine is erected on a massive cast-iron bed-plate, so that the boiler is relieved of all strain due to the engine, and is confined to its legitimate purpose—that of raising steam. The base-plate is formed at one end into an ash-pit, with damper doors, and is made suitable for receiving the fire-box end of the boiler, the other end of which is carried by a crutch shaped casting fixed over the cylinders. The end of the base-plate under the cylinder is formed into a feed water tank, into which the cylinder tanks discharge all condensed water, and into which a portion of the exhaust is so directed as to heat the feed water to nearly boiling point before going into the boiler. The engine has two 7½ in. cylinders, and the stroke is 12 in., on Monday evening they were making 120 revolutions per minute, with 80 lbs. pressure of steam. The driving pulley, 5 ft. diameter, transmits its motion to a second pulley, 2 ft. 6 in. diameter, running on the same shaft with another 3 ft. diameter, which in its turn transmits its motion to the driving pulley, 8 in. diameter, of the Farmer-Wallace machine.

The abundance of electricity generated with a given power, and the regularity of working, gives the Farmer-Wallace machine a great advantage over others, and on Monday evening there was no difficulty whatever in keeping the six lamps in condition, although the current was carried through ¼ mile of conducting wire composed of seven strands of No. 16 copper wire. Owing to the carbon used differing entirely from that used in any other lamp, it has hitherto been impracticable to obtain plates of the same quality as the pencils now generally employed, but this is a defect which will very soon be remedied, especially as the manufacture of plates is even more simple than that of rods. The defect has been to some extent remedied by using a row of Carré pencils carefully packed side by side; but this, of course, gives an inferior result to that obtainable with thoroughly homogeneous carbon plates, so that if some may have found the occasional flicker of the light objectionable, they may congratulate themselves upon the objection being one which will be of only temporary duration. For simplicity, cheapness, and length of time during which the light is maintained without attention the Farmer-Wallace lamp has, thus far, no equal, and allowing for those little imperfections inseparable from even the most perfect inventions upon their first introduction, there is no reason to doubt that the Anglo-American Electric Light Company will be well able to hold its own against all competitors.

#### PLATINUM COATING OF METALS.

The process invented by Mr. J. B. DODÉ, of Paris, for coating metals with platinum was fully described in last week's *Mining Journal*, and the experiments made on Saturday afternoon in the laboratory of Messrs. Johnson, Matthey, and Co., of Hatton Garden, left no doubt that in its practical application the invention is a decided success. The simplicity of the method by which the coating is effected could scarcely be surpassed, whilst the coating is very ornamental, somewhat resembling silver in appearance, and is a thorough protection against oxidation. The iron is first coated with a compound of borate of lead and oxide of copper made into a pigment with turpentine. The article coated with this is brought to a red heat in a furnace, whereby the pigment is burnt into the iron, thoroughly cleansed, and the pores filled up. By this means a smooth and homogeneous metal is obtained—in the case of polished iron and or steel this preliminary coating is unnecessary—to which the platinum solution is applied.

The platinising solution is composed of chloride of platinum held in suspension with essential oils, mixed with borate of lead, litharge, and amylic alcohol. The articles are painted over with the platinising as with the preliminary solution, and are again heated, to drive off the essential oils. As soon as the articles cease to give off vapour the process is finished, and a permanent platinum coating is the result. The cost of the process is said to be extremely small, inasmuch as Mr. Dodé does not require pure platinum, but uses the crude ore of that metal. He, moreover, states that he makes one grain of platinum go as far by his process as 10 grains of silver do by the ordinary electro-deposit process. The Dodé process is ingenious, and Mr. Dodé states that the platinum being infinitesimally divided the cost of applying it to ironwork would not exceed that of painting, whilst the effect is permanent instead of transient, the platinum coated iron remaining unaffected by either damp or acids for an indefinite period. The thinness of the coating—although that coating is thoroughly effective—may be judged of from the fact that Mr. Dodé exhibited a platinised wine bottle, which, although fully protected, was still transparent. The invention certainly promises to be one of great utility, and will, no doubt, be largely applied.

#### REPORT FROM CORNWALL.

Jan. 16.—That in connection with the discouraging condition, local and otherwise, to which we have been exposed during the last fortnight there should be a drop in the tin standard was only to be expected. Our smelters are always very sensitive to the untoward. At the same time, if they anticipated that the stoppage of the Cornish bank would be likely to throw any large quantity of tin on the market, against which they deemed it desirable to prepare by meeting trouble half-way, they are likely to be disappointed. Nobody with any pretension to speak with authority regards this decline as of other than the most temporary character. The general conditions of the market are too favourable for such low prices long to rule.

Nothing further of an authoritative character has transpired with regard to the bank, though the belief is more strongly held than before that the collapse is entirely owing to the relations of Sir F. M. Williams with the concern, and that the Messrs. Tweedy are in no way really responsible for what has happened. Very singular, and in some instances very wild, rumours continue current; but it is doubtful how far they will be developed by the course of events. As to the actual position of the bank, nothing is really known; the probabilities, however, are that under the circumstances those who expect a dividend at all approaching 20s. in 1l. will be unpleasantly disappointed. However, nothing certain can be known upon this until we have the official statement, to be shortly forthcoming.

The failure has given rise to the usual display of ignorance of Cornwall and its conditions on the part of the non-technical portion of the London Press. The Spectator very amusingly ascribes the stoppage to losses on the mine accounts, and want of confidence thence arising, whereas if there were a profitable branch of business which the bank had in hand this was it, and so far as the present current accounts are concerned it is not at all likely the bank will lose a single penny. There was no difficulty indeed in transferring the heaviest. Of course, mine banking, like all things else, is open to some risk, but not quite of the character which the Spectator appears to imagine. Your contemporary does not appear to know anything of cost-book constitutions and of Stannary liquidations. But the funniest part of the whole is the assertion that while the coal and iron trades of this country will revive when other nations want our iron and coal there is no such hope for our copper and tin. It is hardly possible to imagine a more hopeless jumbling together of things which differ. It assumes that we have a practical monopoly of the production of coal and iron, leaving out of sight altogether the question of manufacture; and it is utterly oblivious of the fact that with regard to tin Cornwall, in spite of all which has passed, still occupies its place not on the only but on the chief stanniferous district of the world. Moreover, it is asserted that the deep mines of Cornwall have been beaten by the shallow mines abroad. And here, again, the innocence and ignorance of the writer are seen, or he would never confound "streaming" with "mining." Our deep mining so far as tin is concerned still holds its ground against all mining whatever, and its antipodal streaming competitors even have practically collapsed. They were the chief source of danger, and if they could have held

on we should have little hope. But the richer stream works are already exhausted, and the others have been beaten by the low price of produce. It is a great pity these erroneous views of our great local industry should obtain circulation, for they do infinite harm, and the real cause of the Cornish bank disaster is surely quite apparent enough without the whole of the blame being cast upon that which has already quite enough to bear. A far better estimate of the relative position of home and Australian tin production is to be found in the fact that while our yield is kept fully up to the mark the shipments from Australia in December were only half what they were in the corresponding month of 1877.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Jan. 16.—The new business which has resulted from the Quarterly Meetings is disappointing. Pig and finished ironmakers alike complain that never in their recollection have the gatherings been so unsatisfactory as regards the orders they have brought out. Prices, too, show no tendency to strength, and buyers are as exacting as ever. Offers are made to producers which it is a matter of impossibility to accept, and much of the work which is being done is simply undertaken with a view of keeping the hands together. Only 33 blast furnaces out of 148 erected in South Staffordshire and East Worcestershire are now blowing, and steps which are being taken in several directions point to a reduction in even this small number. The question of the altered rate of payment to the ironworkers by reason of the operation of the Weights and Measures Act is likely soon to be authoritatively settled. The Wages Board will not be called together, but the president, Mr. Joseph Chamberlain, M.P., will have sent to him in writing the cases of the masters and the men respectively, and he will then give his decision. The case for the employers has already been communicated to the operatives, and their secretary is now drawing up the operatives' reply. The new Act is still a topic of much discussion amongst the coal and ironmasters. The district inspector now makes known that the selling of coal in boats according to gauge is illegal, and that the fuel must be weighed into the boats. If this regulation is enforced it will stop the practice so long prevalent hereabouts of ironmasters and others getting in "a boat load" several tons more than the boat gauged for. The coalowners, however, will have to face their customers' application for a corresponding reduction in the prices. I am assured that it is not yet at all certain that the long weight system cannot be legally continued by sales being effected in "lots" or "parcels" of so many lbs. Traders of importance indeed who have consulted high legal authority assert that this can be done, and both in the pig-iron and coal trades they are carrying the opinion into execution.

Staffordshire ironmasters regard with keen interest the award which has been given in the matter of the arbitration in the neighbouring Shropshire iron trade. The award makes the following reduction on the previous wages scale:—Maked bars, No. 4, 15 per cent.; No. 5, 19 per cent.; No. 6, 20 per cent.; No. 7, 28 per cent.; and No. 8, 33 per cent. The men are honourably abiding by the award, although the drop is greater than they had anticipated. They are anxious that their employers should as a body join the South Staffordshire Wages Board, and they have resolved to endeavour to persuade them to do so.

Messrs. James and Jabez Griffiths, late of the Denbigh Hall Colliery, whose creditors, as was reported last week, have been unable to come to any resolution, have been adjudicated bankrupts upon application to the Court.

The North Staffordshire Coal and Iron trades remain quiet. The new year has not brought any large addition of orders. With a view to lessening working expenses, colliery proprietors are still making fresh arrangements with their men. The New Staffordshire Coal and Iron Company have got their miners to accept a 5 per cent. drop. They gave notice for a 7½ per cent. reduction.

#### TRADE OF THE TYNE AND WEAR.

Jan. 16.—There is a slight improvement in some branches of the coal trade, and best house coal commands slightly better rates, about 9d. per ton above the December prices. The shipments of gas coal continue large, and are increasing; this is in some respects the best branch of the trade at present, as those who have secured contracts are able to keep their works regularly going. The steam coal trade is scarcely so good, but the demand is about as usual for the season, but the price of this coal continues very low; only the best works are near fully employed, and many of them are only worked from two to four days per week. Short time at a large number of the collieries in the Northumberland coal field is still, unfortunately, being worked. The Shiremoor Pit especially is doing extremely badly, and has not started since our last report. Work has been provided every day at all the Seaton Delaval Collieries except the old pit, which has been idle one day, whilst at Seghill trade still continues bad. Cambois and Cowpen are still working regularly. The coke trade continues extremely dull, and more pits in Durham are likely to be closed; of course the bulk of the coke produced is disposed of to iron makers. Very little is now consumed by locomotives, hard steam coal being mainly used for that purpose. At many of the pits in Durham enormous stocks of manufacturing and other coal have accumulated, and this, together with the continued dull state of the iron trade has induced the masters to close altogether about ten more collieries, and this will, no doubt, be carried out. In East Durham the Harten and Hilda Collieries continue to work pretty regularly, the bulk of the produce here being good house coal. Seaham and Ryhope and Silksworth Works are nearly fully employed, and a large quantity of coal is put out at those places. At Ryhope 3000 tons per day is raised, and at Silksworth 1500 tons per day.

At Whitburn the final process in connection with the sinking there by the Chaudron system has been somewhat retarded by mishaps, but the insertion of the metal lining will now be accomplished shortly. This lining is cast in rings from 4 to 5 ft. in depth, and the rings are connected together as they are lowered into the shaft, the several joints being made watertight. Those metal rings have been manufactured at the works of Sir William Armstrong, at Elswick. The sinking of this shaft below the water-bearing strata through the shales to the coal seams is expected to be commenced about the end of February.

The Iron-Shipbuilding Trade on the Tyne has got into better working order since the holidays, and one or two new orders have been booked. The tonnage in hand is equal to the requirements of the trade. The Chemical business has been a little depressed during the week, and there have been few transactions entered into with the Continent, but the American market upon the whole is stronger.

The market at Middlesbrough on Tuesday opened with a lack of tone and continued quiet throughout, and business was restricted. The merchants are offering lower rates than most of the makers care to take, and business for forward delivery is kept to a minimum in consequence. The quotations of makers are not quite so good as last week, but average about—No. 1, 38s.; No. 3, 34s. 6d.; No. 4, 34s. net. Merchants state that they have bought No. 3 at 34s. 3d. net. Buyers, however, are scarce even at this rate. The stoppage of three furnaces at Clay Lane, belonging to Thomas Vaughan and Co., is taking place, and the trustees of the estate being unable to sell the works as they stand, will endeavour to realise the loose plant, &c. Two furnaces will be kept in blast by the trustees. The trade in warrants has lately been almost nil, and the nominal quotation is 35s. 6d. No. 3. The experiments in progress for refining Cleveland iron and converting it into steel are still in progress in various parts of the district, and by different experimenters, and increasing hopes of success are being indulged in as headway is gradually being made. The iron shipbuilding, and as a consequence the ship-plate trade also, is being disturbed by the wages question, except on the Tyne, where no movement for reduction has yet taken place. The trade seems to be busier on the Tyne, and lately an order for two fresh vessels has been secured. In the Tees and Wear districts, however, orders are extremely scarce, and there is danger of work falling slack. It is not known yet whether the shipwrights will follow the example of those at Messrs. Dixon's yard at Middlesbrough, and turn out.



The prices of manufactured iron are still low. Plates are 5s. 10s. to 5s. 12s. 6d.; common bars are 5s. 2s. 6d. to 5s. 5s.; angles, 5s. 5s., less 2½ per cent. The plate mills are irregularly employed.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Jan. 16.—Another terrible colliery explosion has occurred in the district, and the Rhondda Valley is again the scene of much excitement in consequence. Over 60 men are entombed in the Dinas Colliery, the property of Colonel Hunt, and the scene of the catastrophe is only about one mile from the Tynwydd pit, famous now in the annals of Welsh mining accidents. The cause of the explosion is up to the present beyond all conjecture. The number of killed is estimated at 63, and there is not the slightest hope of getting any of the men out alive. It was up to last night utterly impossible for any exploring parties to descend. One of the latter, indeed, had a narrow escape; just as they had passed a particular part of the shaft many tons of the side fell. It is said that a portion of the shaft will have to be walled before the bottom can be reached. About 800 men are thrown out of employment by the accident.

The news of the disaster spread with marvellous rapidity, and the adjacent colliery managers were quickly on the spot, ready to render all possible assistance. Amongst these were Mr. Jenkins, of Ton Colliery; Mr. Davis, of Ocean Colliery; Mr. Thomas, of Gelly Colliery; and Mr. Daniel Thomas, of Dinas Isha Colliery. Two or three local medical men, some of the colliery officials, the manager, and several gangs of colliers essayed to go down the pit, but the gas fumes were found to be too strong, and one of their number, David Williams, a fireman, was rendered completely insensible by the fatal odour. The cause of the catastrophe cannot yet be ascertained. Some think that owing to a remarkable atmospheric change there was a strong and sudden effusion of gas from the coal, which exploded by the accidental appliance of a light. Others believe that gas was generated by the fall, and afterwards fired. Others, again, think, and this conclusion is the most likely, that a pit passage into the workings from the downcast shaft got suddenly blocked, either by loosening of earth or self-generated explosion there; that the middle pit ventilator then got impeded, and that gas largely and quickly collected and got ignited. The night overman is amongst the men in the pit. There is one fact which is very severely commented on by the public. The certificate of the old manager of the colliery, Mr. Chubb, was a short while ago suspended for six months because it was considered that gas had accumulated in the workings through his neglect. The management has been nominally changed since, but it is alleged that virtually Mr. Chubb is still manager. The colliery was immediately visited by Mr. Gwyn Williams, stipendiary for the Pontypridd Division; Mr. Wales, mines inspector; Mr. Galloway; Mr. C. H. James, consulting engineer at the colliery; Mr. Wood, the colliery representative at Cardiff; and thousands of the Rhondda inhabitants.

If the catastrophe teaches one lesson more than another, it is that of the necessity of establishing a permanent miners' relief fund. Even the Abercarn Explosion failed to convince the men of the necessity for such a step, although the employers offered substantial aid; but surely with this additional and terrible example the employees will not be so blind to their own benefit as to refuse to join in measures to establish a fund which could be made available for times like the present.

The Abercarn Explosion enquiry has been going on during some days, but the evidence so far has not been very damaging to the officials, although some of the evidence must be taken as adverse—or intended to be so; still it has been generally admitted that all precautions were taken when danger was apprehended. A fireman called spoke distinctly to the safety of No. 4 and No. 17 districts on the night preceding the explosion. It may be added that the Ebbw Vale Company have discontinued all operations, with a view of exploring the pit; and really it seems about the best thing to do. Setting aside, as I have previously remarked, the question of sentiment, I fail to see what practical good can ensue. Months must elapse before any of the bodies could be reached.

A meeting of the shareholders of Richards and Co. has been held at London, and appears to have been a rather stormy one. Ultimately it was resolved that it is desirable to adopt some scheme for carrying on the business of the company, and that the board be requested to mature such a scheme. The meeting was adjourned to consider such scheme; and it was agreed also that five shareholders should be appointed to act in conjunction with the directors.

The announcement of the death of Mr. Jenkins, manager of the Sirhowy Works for upwards of 36 years, has been made. He was much respected by the men under his control. His funeral was attended by almost every agent of the Ebbw Vale Company. The deceased gentleman had passed the allotted period of three score years and ten.

The Alexandra Dock Company, Newport, ever foremost in every improvement, have already fixed the apparatus for lighting the docks with the electric light. Two powerful lights are to be thrown on the dock from each side of the lock. The company has adopted Dr. Siemens' dynamo-electric machine. The motive power is said to be gas.

As to the Iron Trade of the district nothing of an encouraging nature can be brought forward. Some look to an improvement in the spring, but so far it is difficult to see any prospect of an alteration for the better. There is but a poor demand for every description of finished iron; and, then, orders are so scarce and prices so low as to leave no room for profit. The steel trade is rather dull. The steel smelters at the Landore Works have struck work. As for the tin-plate industry there is an improvement, and prices are a little better. The fact of Mr. D. Whitehouse having purchased the Pontymyrr Works, which have for some time been closed, has caused satisfaction in the district. Mr. Whitehouse is the proprietor of the Abercarn Works, and it is believed a start will shortly be made at Pontymyrr of a portion, if not the whole, of the works. As for the Coal Trade, there is apparently a little better demand this week both for steam and house qualities. The former are in good request on foreign account. Prices, though materially unaltered, are rather firmer, and have a slightly upward tendency. Patent fuel is rather quiet. The men employed underground by the Blaenauon Company have resolved not to accept a reduction of wages to enable the works to be carried on at a small margin of profit. The strike at the Pwllsaint Colliery, Forestfach, has terminated, the men accepting the masters' terms.

During last month Newport cleared 2211 tons of iron, compared with 6425 tons in December, 1877; Cardiff 3382, against 4441 tons; and Swansea 1338, against nil. The foreign shipments of coal made last year show a large improvement, Cardiff now being the leading port on this account. This port cleared last year for foreign parts 4,038,306 tons of coal, against 3,658,003 tons in 1877; Newport, 772,503, against 611,156 tons; Swansea, 686,142, against 653,638 tons; and Llanelly, 70,599, against 59,056 tons. Coastwise shipments during the same periods were—Cardiff, 814,871, against 808,410 tons; Newport, 877,290, against 823,921 tons; Swansea, 241,425, against 257,595 tons; and Llanelly, 123,415, against 114,376 tons. In the case of Cardiff last year's shipments were double what they were in 1869, and Newport more than double. Last month Cardiff cleared foreign 302,016 tons of coal, compared with 277,620 tons in December the previous year; Newport, 69,399, against 48,609 tons; Swansea, 68,362, against 54,184 tons; and Llanelly, 3734, against 4650 tons. Coastwise shipments were last month—From Cardiff, 64,987, against 62,696 tons; Newport, 85,306, against 73,428 tons; Swansea, 15,950, against 29,487 tons; and Llanelly, 8022, against 9556 tons. The patent fuel cleared last month from Cardiff was 9350 tons; and Swansea, 6785, against 8289 tons.

**SOUTH WALES INSTITUTE OF ENGINEERS.**—The annual meeting of this association was held at the Royal Hotel, Cardiff, on Thursday, Mr. Richard Laybourne, M. Inst., C.E., in the chair. The attendance was not large, owing to several of the members being engaged at the Abercarn inquest, and the Dinas Colliery explosion. Several new members were ballotted for and admitted. The annual financial statement was laid before the meeting by the president, and was very satisfactory. The paper by Mr. James McMurtrie, F.G.S., on "The Pump-

ing Arrangements at the Radstock Collieries, with an Account of the Sinking and Tubbing of a Pumping Shaft at Tynning Pit, Radstock;" and that by Mr. George Wilkinson, entitled "Some Remarks on Colliery Ventilation, and on the Different Modes of Working the South Wales Steam Coal," read at the last meeting, were discussed. The president read a paper on "A New Reversing Motor, Applicable to Haulage and Marine Engines," to be discussed at the next meeting. After the meeting the annual banquet was held, at which Mr. Laybourne presided, supported by the Mayor of Cardiff, Alderman Lewis; the Mayor of Newport, Mr. Gibbs; the Rev. C. J. Thompson, vicar of St. John's Cardiff; Mr. G. Salmon, town clerk, &c. An excellent repast was provided by Mr. Wain.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Jan. 16.—In a former report I mentioned that the geology of the neighbourhood of Aberystwith had found an able exponent in the person of Professor Keppel, of University College, Aberystwith. Turning to the professor's article, which appeared in the Geological Magazine for December, I am glad, first of all, to find that Mr. Keppel belongs to the influential and increasing band of independent geologists who are resolved to restore the original classification of the ancient rocks of Wales. Who believes, as the Professor says, that the name Silurian was founded on a series of errors made by Sir Roderick Murchison. Albeit through that gentleman's connection with the geological survey the name appears where it should not upon the Government geological maps. Mr. Keppel describes Aberystwith as situated upon an anticlinal ridge, the strata on the south-east side of which dip in long successions eastward all the way to the Devil's Bridge. This is an error. For first if it were true as the professor describes the metalliferous slates of Cardigan would be a long way above the Bala and Llandovery strata of Aberystwith. It fact in the Upper Silurian slates, which would be a phenomena unique in the world, the metalliferous zone of lead and silver-lead in these older rocks lying ever near the base of the Llandovery beds. Further, it is only reasonable to expect that the undulations of strata in North Wales, lying as they do in anticlinal ridges and synclinal troughs trending north-east and south-west, should be prolonged in a south-west direction into Mid and South Wales.

And such is the actual fact. If from Aberystwith the Professor will take a section south-east across the beds he will find that from Aberystwith the strata dip south-east, and form a trough a line down, the centre of which would range from Ynyslas to Tyllwyd. From this line they take an upward curve, older and older strata coming to the surface, until we reach the centre of an anticlinal ridge along a line drawn from a little to the east of Machynlleth, through Darren Fawr on the south-west. Along this line, and situated in the oldest beds of the district, is the great metalliferous zone, containing to the right and the left some of the richest mines of the county of Cardigan. From this line the strata take a downward curve to the south-east, and form a trough that holds the Wenlock and Taranon shales from Talerddig cutting on the Cambrian Railway south-westward, including most of the Plymlymmon district. South-east of this the beds again turn upwards, bringing to the surface the lower productive strata of the Van district, from whence they take a final plunge under the overlying Wenlock shale of East Montgomery, Shropshire, and Radnor. I should have liked to have seen a fuller description of the lodes of Cardigan in the article, but the paper is only an instalment of the work promised. The sketch I have rapidly given will be found the key to the geology of the Mid-Wales district, and it would be a valuable addition to our knowledge, as I have often insisted, if sections of mines could be carefully taken along the ridges and troughs of strata I have indicated. In this way we should come at last to a clear understanding of the limits and position of the strata productive of metalliferous minerals in the region.

Should anyone in the district from which I write wish to see an Ingersoll rock-drill at work, I would direct them to the New Crickheath Lead and Blende Mine, near Llyncllys Station, on the Cambrian Railway. A party of gentlemen interested in mining visited the mine on Thursday last, and were much pleased and interested in the work done, as well as obliged by the courtesy of the manager, Captain Henderson. The boring was going on at the end of a level about 400 yards from the compressor. Working at 40-lbs. pressure the drill bored 19 inches in three minutes and 27 inches in eight minutes, the last trial including some stoppages. The rock was a mixture of limestone and indurated clay. The boring advances at the rate of about 12 yards a week; the object in view is to get below some once rich mineral ground, whence a good deal of ore was, from the 16th to 18th century, obtained. The proprietors deserve the success their visitors wished them. There is nothing particular to record this week relative to the progress of mining and its associated industries.

**AUTOMATIC COUPLING ON RAILWAYS.**—At the Society of Arts, on Wednesday, a paper was read by Mr. T. A. Brockelbank "On Economy and Safety by the Use of Automatic Couplings on Railways." Lord Alfred Churchill was in the chair. The lecturer prefaced his remarks by saying that, enormous as had been the improvements which had occurred within the last few years in the various details of railway traffic management, the system of coupling the carriages and wagons remained as clumsy and dangerous in practice as it had been half a century ago. Various obstacles had hitherto stood in the way of its reform, and unless it could be shown that the companies would derive pecuniary benefit from the adoption of automatic or mechanical means for coupling vehicles it was hardly to be expected that the matter would be seriously taken up. He proceeded to give numerous statistics to show that an immense saving might be effected both in time and money by the general adoption of some such process, while numerous collisions which are at present occasioned by delays in shunting might thereby be avoided. Allowing only ten seconds of time as the difference in favour of the automatic process of coupling, he calculated that in 12 months' working a period of no less than 100 years (night and day) would, by its adoption, be left clear to the traffic superintendents of the ten chief railways in England and Scotland alone for the dispatch of other traffic; while at the rate of 1s. a journey the money saving would amount on an average to 25,000l. per annum to each of the ten companies. At the close of the lecture Mr. Thomas Ashbury, of Manchester, remarked that automatic coupling had been largely used abroad, and had proved entirely successful.

**INSTITUTION OF MECHANICAL ENGINEERS.**—The anniversary meeting of this society was held at the Institution of Civil Engineers, on Thursday and Friday—Mr. John Robinson, of Manchester, in the chair. The audited accounts showed that the income for the year had exceeded the expenditure by 124l. 11s. 3d. It was stated that the institution had been registered as a limited company, in accordance with a resolution already passed, and the sanction of the Board of Trade had been obtained to omit the word "limited," so that they would still remain the "Institution of Mechanical Engineers." It was then resolved that the corporation be authorised to accept the transfer of the investments at present standing in the names of trustees. The names of the new officers were announced, and certain new by-laws added. It was proposed to insert a by-law sanctioning compounding for future subscriptions by payment of 15 years' subscription, including current year, in advance; but it was pointed out that this compounding prevented the exclusion of the poor or objectionable members, and an amendment was, therefore, ultimately carried, several of the members regarding the matter as an actual question, on the proposition of Mr. Hawkeley, seconded by Mr. Paget, that the system of compounding be discontinued. The voting was 16 against compounding, and 12 in favour of it. It was next resolved "That the council be authorised to expend a sum not exceeding 3000l. out of the funds of the institution during the year 1879 for the purpose of promoting practical research in mechanical subjects." The President stated that the line of research which the council were disposed to suggest was in the direction of (1) the conditions of the hardening and tempering of steel; (2) the corrosion of different classes of steel and iron; and (3) the best form and best mode of preparing rivetted joints in iron and steel plates.

The next meeting is to be held in Glasgow. Capt. O. G. Brown, R.A., of Woolwich, then read a paper "On the Construction of Armour to Resist Shot and Shell," in connection with which he explained, by means of diagrams, the effect produced by flat and ogival headed shot on wrought iron, chilled iron, steel, and compound plates, and sandwich, teak, and metal armour. From the way in which the plates are damaged Capt. Brown concludes that the hope is rather to force the work to take some form which the target may bear than to increase the

injury in actual quantity. He suggests thick steel armour covered with comparatively thin front plates of wrought-iron of large area, so that if the steel crack it would be held together by the iron covering. A remarkable experiment may be noted in connection with this. A steel plate which withstood the projectiles fired had an iron plate added in front, when the same projectile penetrated the iron plate, but the wrought iron on the target had produced this effect, Capt. English, R.E., suggested that the shot should be capped with wrought-iron, fired at the bare steel, when it was found to penetrate where the previous shell shot had failed. It would seem, then, that actual penetration into a structure of steel covered with a thin plate of iron would be deeper than into steel; but is probable that thick hard masses of steel covered by iron would, on the whole, be the best form of armour.

In the discussion which followed, which had but a very remote connection with the paper read, Dr. Siemens expressed the opinion that the compound armour plating would not give all the results expected, because if you unite two substances there must be lamination, and either the two metals would separate, or the weld would be torn to pieces by the stronger. The armour plate should always be of yielding character, but the shell being smaller than the plate, it would always, easy to make a projectile which would pierce any given armour plate. Capt. Colum, R.N., pointed out the difficulty in a sea fight of choosing the angle, which your ship shall stand with regard to the enemy. One combatant, usually both, is a moving body, and could, therefore, scarcely suffer from many shots at the same point. He preferred steel to wrought-iron armour, because it took the work at right angles to the shot's power instead of in the direction of it. In practice, at sea, the backing of the armour is not fired by the enemy's shot, but course unprotected portions of a ship might possibly be fired by an ordinary shot, piece. Mr. Paget suggested that the wrought iron cap to the projectile might have acted as a lubricant, and, considering the facts stated by Capt. Browne, thought might be found that the force of the shot could be absorbed by using soft cheap metal of greater thickness. Capt. Browne having replied, thanks were voted him for his paper, and the meeting adjourned.

#### ANNUAL METAL REPORT.

The Metal Trade has had its full share of the general depression and disaster of 1878. A year ago many were sanguine enough to believe that the worst had been reached—indeed, after five years of steady decline in prices, and decrease in volume of business in most branches of industry, the hope that the time for improvement had arrived was not unreasonable; but the stagnation and misfortune of 1878 were far in excess of the worst anticipations of those who looked for a continuance of falling prices and general depression, and there is as yet not much to encourage the hope of an early revival of activity. However, prices of iron, coal, cotton, and food are so low that there is little room for further decline, and it is satisfactory to know that the risk of loss from "shrinkage" of stocks is no longer a matter of apprehension.

In the Iron Trade wages have fallen since January, 1873, above 50 per cent., but they are still too high to enable the manufacturers to carry on their works at a profit—indeed, the published accounts of many joint-stock concerns disclose the fact that even at present wages too many are carrying on business at disastrous loss. In every district there have been failures, and thousands of skilled ironworkers are unable to find employment at any price. There is no prospect of any revival of exports of manufactured iron to the United States; there the capacity of production is still in excess of consumption. Germany has not only ceased to be a customer for finished iron, but has taken a considerable portion of our Spanish trade, and is exporting to England also. In all districts there was a decrease in the output of pig-iron as compared with 1877; nevertheless, the stock of pig-iron in Scotland and Middlesbrough is estimated to have increased to 1,000,000 tons. The exports of pig-iron show a comparatively satisfactory result; shipments from Middlesbrough district being slightly in excess of 1877. In Scotch pig the foreign shipments are about 40,000 tons less than 1877.

Blast furnaces in South Staffordshire... 148, of which 39 are in blast  
North Staffordshire... 43  
Middlesbrough & Consett... 116  
Scotland... 155

In South Staffordshire and East Worcestershire 130 works for the production of finished iron and ironwork are closed. During the year there were 145 strikes in connection with the coal and iron trades.

STEEL is steadily taking the place of iron for many purposes, and this accounts in some measure for the closing of many finished ironworks. The price for steel rails is so near that of iron that there is no inducement to buy the cheaper article—indeed, one large concern in Belgium is quoting steel and iron rails at same price. Rapidly as the steel trade is increasing, it is very unsatisfactory to know that prices are quite unremunerative.

TIN-PLATES.—For the first eight months there was continuous decline in prices, the excessive production and the operations of weak speculators (who were always urgent to realise their holdings at prices below makers' quotations) having a very prejudicial influence on the market. During September the market was cleared of the heavy second-hand holdings, and about the same time the makers entered into an arrangement to restrict the output. Common coke tin-plates have in consequence rallied about 2s. to 2s. 6d. per box, but the improvement in charcoal quality is not at all in the same proportion. The exports from Liverpool were 2,076,125 boxes, against 2,102,210 boxes in 1877.

TIN.—The market, owing to heavy stocks and continued large supplies from Australia, was in a dull and declining condition until the end of September; it was then said that a Scotch speculator, who had for a long time held 1000 tons, was forced by his bankers to realise. Certain it is that forced sales caused a rapid decline about that time from 61l. 10s. to 52l., but it speedily recovered from this extreme depression.

For three or four years past doubts have been expressed as to the continuance of Australian supplies, but so far each year's supply has shown a considerable increase, and last year the arrivals amounted to 9764 tons. In July a paragraph in the Times announced the discovery of a mountain of tin on the West Coast of Tasmania. The existence of the tin mountain is authoritatively denied in the Mining Journal, but it is admitted that a discovery of tin ore has been made at the place mentioned, that the earth washings yield good results, and that there is every indication of a very valuable tin mine. Explorations are in progress with the view of striking the Mount Bischoff great tin lode on the other side of the hill. Meanwhile a correspondent in Australia, largely interested, reports that low prices are undoubtedly reducing the quantity of tin ore raised.

**PRODUCTION AND CONSUMPTION OF TIN FOR EUROPE.**

	1878—Tons.	1877—Tons.	1876—Tons.
Production in Cornwall and Devon	9,485	9,385	8,500
Sales of Banca in Holland	3,960	4,224	4,381
Imports of Billiton in Holland	3,417	3,053	3,305
" Straits in London	3,375	3,014	5,767
" Australian in London	9,674	8,558	7,178
" Bolivian in Liverpool	250	290	380
Total supply for Europe	30,161	28,524	29,511
Total consumption—Europe	28,779	27,426	26,897
Shipments from Straits—Europe	4,262	2,882	6,368
" America	3,930	4,282	2,900
" Australia—Europe	8,593	8,932	7,062
" America	388	640	—
Average price of Straits in London	£61 10s.	£69	£74 10s.

COPPER.—The extreme fall in copper was over 10l. per ton, Chili bar being 65l. 10s. in January; in September the price had fallen to 60l.; in October a heavy failure, resulting in forced realisation of stock, caused Chili bar to fall below 55l., since when the market has rallied about 3l. per ton.

Aggregate stock Dec. 1, 1877... Tons 52,260  
" 1878... 53,621

ZINC and SPALTER declined steadily during the year, and prices are lower than they have been for seven or eight years.

LEAD.—The fall in price was very heavy, amounting to about 5l. per ton, the chief cause being the great increase in production of lead in the United States, not only rendering that country independent of supplies from Europe, but enabling the American producer to take from us a large portion of our India and China customers.

ANTIMONY has been very steady, and has fluctuated but slightly. Liverpool, Jan. 8.

BRITISH SILVER-LEAD MINES.—The agent writes—"Since operations commenced we have proved the main lode for several hundred yards on its course by trial pits on its back, and find it powerful, strongly mineralised, and well defined; also, as depth is obtained







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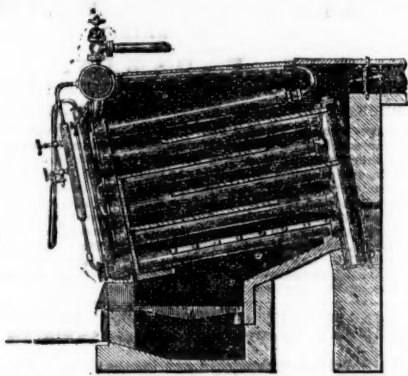
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labour.

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2000	Bryn Alyn, s. i., Denbigh	10 00	...	...	0 7 0	0 10	Jan. 1877
10000	Caron, i., Cardigan	2 00	...	...	0 4 0	0 20	Oct. 1878
1000	Carn Brea, c. i., Illogan	55 7 6	...	...	309 0 0	1 0 0	Oct. 1878
400	Cashwell, i., Cumberland	2 10 0	...	...	1 9 6	0 20	Aug. 1878
2480	Cook's Kitchen, i., Illogan	25 4 9	...	...	11 17 0	0 10	Jan. 1878
240	Devon G. Consols, c. i., Tavistock	1 0 0	...	...	116 15 0	0 50	July 1877
4296	Dolcoath, c. i., Camborne	10 14 10	...	...	113 1 3	0 50	Nov. 1878
5000	East Black Craig, s. i., Scotland	8 0 0	...	...	0 10 0	0 10	Feb. 1877
300	East Darren, i., Cardiganshire	82 0 0	...	...	235 10 0	1 0 0	Aug. 1878
6400	East Pool, i., Illogan	0 9 9	...	...	15 13 3	0 18	Nov. 1878
40000	Glasgow Carr, c. i., 30,000 £1 p., 10,000 15s. p.	1 0 0	...	...	0 13 10	0 06	Aug. 1878
7500	Glendow and Merlyn Cons., i., Flint	2 10 0	...	...	0 8 0	0 50	Aug. 1877
15000	Great Laxey, i., Isle of Man	4 0 0	...	...	24 10 0	0 50	Jan. 1879
615	Gt. Botallack, i., Wexham	5 18 8	...	...	0 16 0	0 16	May 1878
6400	Green Harth, i., Durham	0 6 0	...	...	2 2 0	0 30	Mar. 1878
9000	Grognolton, i., Cardigan	2 0 0	...	...	0 13 9	0 10	Aug. 1878
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80000	Holmbush, s. c. i., Callington	1 0 0	...	...	0 4 6	0 06	Sept. 1877
2800	Iale of Man, i., Isle of Man	25 0 0	...	...	82 5 0	0 10	Feb. 1878
20000	Leadbills, i., Llanarkshire	8 0 0	...	...	0 15 0	0 30	Mar. 1878
400	Lisburne, i., Cardiganshire	18 15 0	...	...	587 10 0	1 0 0	Aug. 1878
14000	Llanidloes, i., Montgomery	3 0 0	...	...	0 9 0	0 46	Nov. 1878
9000	Marke Valley, i., Llanidloes	8 3 6	...	...	7 15 0	0 20	Jan. 1878
10000	Mellandur Copper, Hayle	2 0 0	...	...	0 5 0	0 30	July 1878
9000	Minera Mining Co., i., Wrexham	5 0 0	...	...	87 17 8	0 20	Nov. 1878
20000	Miner's Co. of Ireland, s. i., c.	7 0 0	...	...	23 17 6	0 26	Jan. 1878
1024	North Bury, c. i., Chacewater	1 14	...	...	1 0 0	0 50	Oct. 1878
289	North Hendra, i., Wales	2 0 0	...	...	2 12 0	0 50	Dec. 1878
30000	Panty Mwyn, i., Mold (8794 ss.)	2 0 0	...	...	0 3 0	0 20	Aug. 1878
5000	Pedn-ar-drean Con., i., Redruth	0 6 0	...	...	0 9 0	0 20	June 1877
5000	Penhall, i., St. Agnes	3 5 6	...	...	3 13 6	0 20	July 1878
6000	Pennant, i., bar, North Wales	5 0 0	...	...	0 7 0	0 50	Oct. 1878
45793	Pennant, i., c. i., Gwennap	2 0 0	...	...	0 2 8	0 50	Nov. 1878
18000	Prince Patrick, s. i., Holywell	1 0 0	...	...	0 14 0	0 18	Jan. 1878
10000	Red Rock, s. i., Cardigan	2 0 0	...	...	0 14 0	0 20	Jan. 1878
12000	Roman Gravel, i., Salop	7 10 0	...	...	7 15 0	0 30	Mar. 1878
512	South Cardigan, c. i., St. Cleer	1 5 0	...	...	744 10 0	1 0 0	Nov. 1878
6128	South Cardigan, c. i., Camborne	6 6 6	...	...	4 17 0	0 18	Jan. 1879
12000	St. Harmon, i., i., Montgomery	3 0 0	...	...	0 12 0	0 30	July 1878
10000	St. Pr. Patrick, s. i., (8000 ss. issued)	1 0 0	...	...	0 12 0	0 30	July 1878
4500	South Fr. Frances, i., Illogan	7 12 4	...	...	37 12 0	0 10	Oct. 1878
10000	Tankerville, i., Salop	6 0 0	...	...	4 17 0	0 70	Jan. 1879
4000	Tanvor, c. i., Pool, Illogan	11 10 0	...	...	50 8 6	0 50	May 1878
15000	Van, i., Llanidloes	4 5 0	...	...	23 10 0	0 50	Jan. 1879
3000	W. Chiverton, i., Perranabuloe	12 10 0	...	...	55 10 0	0 10	Feb. 1878
1785	West Fildes, c. i., Redruth	11 0 0	...	...	1 10 0	0 10	July 1878
612	West Fildes, c. i., Redruth	95 10 0	...	...	32 0 0	0 10	Nov. 1878
2048	West Fildes, c. i., Redruth	28 15 3	...	...	3 12 6	0 30	Nov. 1878
600	West Wh. Consols, c. i., Camborne	49 0 0	...	...	446 0 0	0 15	Apr. 1878
12000	West Wye Valley, i., Montgomery	8 0 0	...	...	0 12 0	0 30	Nov. 1878
1024	Wh. Eliza Consols, i., St. Austell	5 0 0	...	...	19 10 0	1 10	Aug. 1878
2048	Wh. Eliza Consols, i., St. Austell	5 13 10	...	...	8 5 0	0 50	July 1878
4296	Wh. Eliza Consols, i., St. Austell	5 4 6	...	...	11 19 6	0 26	Dec. 1878
25000	Wh. Newton, s. c. i., Calstock	1 0 0	...	...	82 10 0	4 0 0	Sept. 1878
80	Wh. Ovels, i., St. Just	173 15 0	...	...	0 15 0	0 40	Nov. 1878
3000	Wh. Pever, i., Redruth	7 11 0	...	...	0 4 0	0 10	July 1878
10000	Wye Valley, i., Montgomery	3 0 0	...	...	0 10 8	0 46	Oct. 1878

## FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
35500	Alamillos, i., Spain	2 0 0	...	...	1 19 9	0 06	Oct. 1878
30000	Almaden and Tiroto Consol., s. i.	1 0 0	...	...	0 6 0	0 10	May 1878
20000	Australian, c. i., South Australia	7 7 8	...	...	1 0 6	0 20	July 1878
10000	Battle Mountain, s. i., (6240 part pd.)	5 0 0	...	...	0 10 0	0 10	Nov. 1878
15000	Birdseye Creek, c. i., California	4 0 0	...	...	0 14 0	0 26	June 1878
20000	Cape Copper Mining, i., So. Africa	7 0 0	...	...	20 2 6	0 17	Dec. 1878
34438	Cedar Creek, c. i., California	8 0 0	...	...	0 18 0	0 26	June 1878
15000	Cosmos Sul. Co., Romanga, Italy	10 0 0	...	...	0 2 0	0 20	Nov. 1878
65000	Colorado United, s. i., Colorado	5 0 0	...	...	13 6 0	0 40	Nov. 1878
10000	Copland, c. i., Chili (20 shares)	10 15 6	...	...	7 11 5	0 30	May 1878
100000	Don Pedro North of the Rey	0 18 0	...	...	3 5 9	0 30	May 1878
25500	Eberhardt & Aurora, s. Nevada	10 0 0	...	...	1 8 0	0 30	Dec. 1877
70000	English & Australian, c. i., B. Aust.	2 10 0	...	...	25 19 0	0 10	Dec. 1877
80000	Flagstaff, s. i., Utah	10 0 0	...	...	4 20 0	0 10	Mar. 1877
25000	Fortuna, i., Spain	10 0 0	...	...	7 3 2	0 34	July 1878
55000	Frontino & Bolivia, s. New Gran.	2 0 0	...	...	0 2 6	0 16	Sept. 1878
80000	Gold Run, s. i., Idaho	1 0 0	...	...	0 2 4	0 40	Oct. 1878
80000	Kapunda Mining Co. Australia	1 30	...	...	0 14 0	0 20	June 1878
20000	Last Chance, s. i., Utah	5 0 0	...	...	17 10 4	0 26	Oct. 1878
15000	Linares, i., Spain	2 0 0	...	...	0 10 0	0 10	July 1878
85000	Llanidloes, c. i., California	2 0 0	...	...	11 11 6	0 16	Mar. 1878
7837	Lustanion, Portugal (25 sh.)	3 10 0	...	...	0 5 0	0 50	Dec. 1878
5000	Mamm. Copperopolis of Utah, c. i.	10 0 0	...	...	0 4 0	0 40	Jan. 1879
6000	Mountain Chief, s. i., Utah	10 0 0	...	...	26 18 0	0 19	Dec. 1878
10000	Pontigbau, s. i., France	20 0 0	...	...	11 0 0	0 10	Sept. 1878
100000	Port Phillip, s. i., Clunes (25 sh.)	1 0 0	...	...	6 11 6	0 10	Nov. 1878
54000	Richmond Consols, s. Nevada	5 0 0	...	...	0 6 9	0 10	Nov. 1878
40000	Santa Barbara, s. i., Brazil	0 10 0	...	...	15 per cent.	...	Nov. 1878
120000	Scottish Australian Mining Co., New	1 0 0	...	...	2 19 0	0 10	Oct. 1878
14026	S. B. Plumas Eureka	2 0 0	...	...	0 14 2	0 30	Oct. 1878
60000	Sierra Buttes, c. i., California	2 0 0	...	...	1 year 15 p. ct.	...	Nov. 1878
100000	St. John del Rey (25 stock & multiples dealt in)	250 260	...	...	0 11 6	0 86	May 1878
20000	Tollima, s. i., So. America	5 0 0	...	...	0 12 6	0 86	May 1878
20000	Victoria (London), s. i., Australia	1 0 0	...	...	0 12 0	0 12	Jan. 1879
15000	Western Andes, s. i., New Granada	8 0 0	...	...	1 10 0	0 40	Jan. 1879
21000	W. Prussian (6500 pref. sh. 101. pd)	10 0 0	...	...	1 10 0	0 40	Jan. 1879

## NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
12000	Argentine, s. i., Argentina Republic	8 0 0	...	...	...	...	...
3000	Bellavista, s. i., Peru (20 shares)	10 0 0	...	...	...	...	...
3000	Blue Tent, s. i., California	10 0 0	...	...	...	...	...
10000	Buena Ventura, s. i., Llanos de las Infantas, Spain (25 sh.)	5 0 0	...	...	...	...	...
49535	Chontales, s. i., Nicaragua	0 5 0	...	...	...	...	...
15000	Condes de Chilli, s. i.	2 0 0	...	...	...	...	...
10000	English Australian, s. i., Victoria	5 0 0	...	...	...	...	...
35 30	Excellior Hydraulic Gold Washing Co., California	6 0 0	...	...	...	...	...
100000	Eschequer, s. i., California	1 0 0	...	...	...	...	...
40000	Holcombe Valley, s. i., California	1 0 0	...	...	...	...	...
80000	Honzach, s. i., Spain	1 0 0	...	...	...	...	...
12000	Hunter Consolidated, s. i., Utah	10 0 0	...	...	...	...	...
20000	Imperial Brazilian Colliery, Brazil	5 0 0	...	...	...	...	...
7500	Isabelle, s. i., California (25 shares)	5 0 0	...	...	...	...	...
100000	J. X. s. i., California	5 0 0	...	...	...	...	...
60000	Javali, s. i., Nicaragua	1 0 0	...	...	...	...	...
3500	La Mancha, i., Newfoundland	2 0 0	...	...	...	...	...
12000	Llanidloes, s. i., Viscaya, Spain (25 shares)	10 0 0	...	...	...	...	...
75000	Malabar, s. i., Colombia (27188 issued)	1 15 0	...	...	...	...	...
40000	Malpasco, s. i., Colombia (7400 pref. shares, fully paid)	1 0 0	...	...	...	...	...
10000	Monzenberg, c. i., Housen, Germany	5 0 0	...	...	...	...	...
4588	New Benberg, i., i., Germany	5 0 0	...	...	...	...	...
60000	New Quebrada, c. i., Venezuela	5 0 0	...	...	...	...	...
20000	New Zealand Kapanga, s. i., Coromandel	5 0 0	...	...	...	...	...
3000	Oregon, s. i., Oregon, U.S. (preference shares)	5 0 0	...	...	...	...	...
50000	Panulillo, c. i., Chili (250000 debentures)	4 0 0	...	...	...	...	...
50000	Pastorana United, s. i., Italy	4 0 0	...	...	...	...	...
25000	Pitangui, s. i., Brazil (incl. 8000 sh. £1 fully paid)	3 0 0	...	...	...	...	...
25000	Pitangui, s. i., Brazil (incl. 8000 sh. £1 fully paid)	3 0 0	...	...	...	...	...
50000	Providence and New Rosario, s. i., Mexico	2 0 0	...	...	...	...	...
40000	Ravenscroft, s. i., New Zealand; c. i., South Australia	1 0 0	...	...	...	...	...
50000	Rio, s. i., Colombia (40000 issued)	1 0 0	...	...	...	...	...
20000	Rio Grande, s. i., Brazil (21 shares)	1 0 0	...	...	...	...	...
30000	Russia Copper, Orenburg and Ufa	10 0 0	...	...	...	...	...
10000	Silver Plume, s. i., Colorado	10 0 0	...	...	...	...	...
80000	Teoma, s. i., Utah	10 0 0	...	...	...	...	...
43174	United Mexican, s. i., Mexico	29 0 3	...	...	...	...	...
14000	Utah, s. i., Utah	5 0 0	...	...	...	...	...
50000	Vierberg, c. i., Rheinbreitbach, Germany	5 0 0	...	...	...	...	...
15000	Yorke Peninsula, c. i., South Australia	2 0 0	...	...	...	...	...
54500	Yorke Peninsula, c. i., South Australia Preference	1 0 0	...	...	...	...	...

\* Have made calls since last dividend was paid.

## FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
Argentine, 1868 6 per cent.	68 70	...	...	...	...	...	...
Brazilian, 1865 6 per cent.	27 28 1/2	...	...	...	...	...	...
Chilian, 1866 7 per cent.	80 82	...	...	...	...	...	...
City of Providence, 6 p. coupon bonds	88 91	...	...	...	...	...	...
Egyptian, Gov. preference	99 101	...	...	...	...	...	...
Do., unified debt, scrip	71 71 1/2	...	...	...	...	...	...
Do., 7 per cent. V.M.	49 50 1/2	...	...	...	...	...	...
Do., 6 per cent. guar.	79 81	...	...	...	...	...	...
Do., K. Daira Sanieh	82 84	...	...	...	...	...	...
Foreign and Col. Gov. Trust, 6 p. ct.	66 71	...	...	...	...	...	...
Do., 5 per cent., 3d issue	68 63	...	...	...	...	...	...
Do., 1872, 4th issue	68 68	...	...	...	...	...	...
Do., 1872, 5th issue	55 60	...	...	...	...	...	...
Paruvian, 1870, 6 per cent.	52 57	...	...	...	...	...	...
Do., 1872, 5th issue	14 14 1/2	...	...	...	...	...	...
Russian, 5 1/2 per cent. L. Mort.	11 12 1/2	...	...	...	...	...	...
Spanish, Quicksilver Mort., 5 p. ct.	96 98	...	...	...	...	...	...
United States Mort., 6 per cent.	99 101	...	...	...	...	...	...